

Absorbance



Plate Washing



Luminescence



Automated
Processing



Software



Consumables

DYNEX
TECHNOLOGIES

Experts In Microplate Analysis

A background image of a laboratory instrument, likely a microplate reader or washer, with a white and grey color scheme. The instrument has a large, clear, rectangular window on the right side. In the foreground, there is a multi-well microplate being processed. The overall image is slightly faded and serves as a backdrop for the title text.

Concert™ - TRIAD™ Series Software

User's Manual

DYNEX Technologies, Inc.
14340 Sullyfield Circle, Chantilly, VA 20151-1621
Phone: (703) 631-7800 FAX: (703) 803-1441
www.dynextechnologies.com

Revision History

Revision Date:

April 2005

Catalog No. 61000025

This manual is published by DYNEX Technologies, Inc.

Questions or comments regarding the content of this manual can be directed to the address below or to your supplier.

DYNEX Technologies, Inc.
14340 Sullyfield Circle
Chantilly, VA 20151-1621 USA

Telephone: (800) 288-2354, (703) 631-7800

Fax: (703) 803-1441

Website: www.dynextechnologies.com

DYNEX Technologies reserves the right to make technical improvements to this equipment and documentation without prior notice as part of a continuous program of product development. This manual supersedes all previous editions.

Microsoft® and Windows® are registered trademarks of the Microsoft Corporation. IBM is a trademark of International Business Machines Corporation in the United States, other countries, or both. Pentium is a registered trademark of Intel Corporation. Adobe, Acrobat, and Postscript are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States and/or other countries. All other trademarks appearing in this manual are the property of their respective owners. © 2005 Beckman Coulter, Inc. All rights reserved.

Warranty and Special Provisions Limited Warranty

DYNEX Technologies' products are fully guaranteed for one year against defects in parts, materials, and workmanship. Defective parts and materials will be replaced or, at the discretion of DYNEX Technologies, repaired at no charge for a period of one year and labor required for such replacement or repair will be provided at no charge for a period of one year, provided that the products are utilized and maintained in accordance with the instructions in the applicable operating and servicing manual, and provided further that the products have not, as determined solely by DYNEX Technologies, been subject to misuse or abuse by the Customer or other parties unrelated to DYNEX Technologies. DYNEX Technologies makes no warranty, expressed or implied, as to the fitness of any product for any particular purposes other than those purposes described in the applicable operating and servicing manual, nor does DYNEX Technologies make any other warranty, whether expressed or implied, including merchantability, other than those appearing on the face hereof. Where DYNEX Technologies guarantees any product, whether under this Warranty or as a matter of law, and there is a breach of such guarantee, the Customer's only and exclusive remedy shall be the replacement or repair of defective parts and materials, as described above. This shall be the limit of DYNEX Technologies liability. Furthermore, DYNEX Technologies shall not be liable for incidental or consequential damages. Failure of the Customer to notify DYNEX Technologies of a claimed defect by registered mail within thirty days of the discovery thereof shall constitute a waiver of any claim for breach of warranty.

When a product is required by DYNEX Technologies to be installed by a DYNEX Technologies engineer or technician, the period of this Warranty shall begin on the date of such installation, provided, however, that any use of the product prior to such installation shall, at the sole election of DYNEX Technologies, void this Warranty. When installation by DYNEX Technologies personnel is not required, the period of this Warranty shall begin on the date of shipment from DYNEX Technologies. The period of this Warranty shall begin as described above whether or not the product has been installed or shipped pursuant to a purchase order, and any trial period shall be deducted from the Warranty period that would otherwise apply under a subsequent placed purchase order for that product.

Limitation of Liability. Notwithstanding anything to the contrary contained herein, the liability of SELLER (whether by reason of breach of warranty, breach of contract, tort, or otherwise), including without limitation under any indemnification provision contained herein, shall be limited to replacement of goods returned to DYNEX Technologies which are shown to DYNEX Technologies' reasonable satisfaction to have been nonconforming or to refund the purchase price, or, if not paid, to a credit amount of the purchase price therefore.

THE FOREGOING WARRANTIES ARE EXCLUSIVE AND ARE GIVEN AND ACCEPTED IN LIEU OF ANY AND ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, THE IMPLIED WARRANTY OF MERCHANTABILITY AND THE IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. NEITHER PARTY SHALL BE LIABLE TO THE OTHER FOR ANY INCIDENTAL, INDIRECT, SPECIAL, OR CONSEQUENTIAL DAMAGES.

Safety Information

All Warnings and Cautions in this document include an exclamation point, a lightning bolt, or a light burst symbol framed within a triangle. Please pay special attention to the specific safety information associated with these symbols.



WARNING: If the equipment is used in a manner not specified by DYNEX Technologies, Inc., the protection provided by the equipment may be impaired.

Warning and Caution Definitions



The exclamation point symbol is an international symbol which serves as a reminder that all safety instructions should be read and understood before installation, use, maintenance, and servicing is attempted.

When this symbol is displayed in this manual, pay special attention to the specific safety information associated with the symbol.

WARNING

A **WARNING** calls attention to a condition or possible situation that could cause injury to the operator.

CAUTION

A **CAUTION** calls attention to a condition or possible situation that could damage or destroy the product or the operator's work.

Warnings and Cautions Found in this Manual

Please read and observe all cautions and instructions. Remember, the most important key to safety is to use Concert - TRIAD Series Software with care.

The WARNINGS and CAUTIONS found within this document are listed below.



WARNING: If the equipment is used in a manner not specified by DYNEX Technologies, Inc., the protection provided by the equipment may be impaired.



CAUTION: Shake low density plates, such as 6- or 48-well plates, at low speed only. Shaking low density plates at higher speeds may cause liquid in wells to spill.



CAUTION: The plate height configured must not be less than that of the actual plate. Doing so may cause the TRIAD optics transport to collide with the plate during a Read Height Optimization.

Table of Contents

Safety Information	v
Table of Contents	vii
List of Figures	xiii
List of Tables	xvii
1 Installing, Setting Up, and Using the Software	
1.1 Overview	1-1
1.2 Using Concert - TRIAD Series Software	1-2
1.2.1 Launching the Software	1-3
1.2.2 Using the Software Interface	1-4
1.2.2.1 About the Navigation Pane	1-4
1.2.2.2 About the Toolbar	1-5
1.2.2.3 About the Selection and Configuration Pane	1-5
1.2.3 Accessing Online Help	1-5
1.3 Installing Concert - TRIAD Series Software	1-6
1.3.1 Meeting System Requirements	1-6
1.3.2 Installing Concert - TRIAD Series Software on Windows® 2000 or XP	1-7
1.3.3 Installing Concert - TRIAD Series Software on Windows NT®	1-9
1.3.4 Installing Optional Modules	1-10
1.3.5 Repairing or Removing the Concert - TRIAD Series Software Installation	1-11
1.4 Setting Up Concert - TRIAD Series Software	1-12
1.4.1 Configuring Communication Settings	1-14
1.4.2 Configuring Software Settings	1-16
1.4.2.1 Configuring Print Settings	1-17
1.4.2.2 Choosing Simulated Data Files	1-18
1.4.2.3 Choosing the Directory Where Exported Measurement Results are Saved	1-19

2 Setting Up and Controlling Instruments

2.1	Overview	2-1
2.2	Controlling Instrument Actions	2-3
2.2.1	Ejecting the Plate Carrier	2-3
2.2.2	Loading the Plate Carrier	2-3
2.2.3	Initializing the Instrument.	2-4
2.2.4	Connecting to the Instrument	2-4
2.2.5	Enabling Simulation Mode	2-5
2.3	Configuring Instrument Settings	2-6
2.3.1	Configuring Basic Instrument Settings	2-7
2.3.2	Defining and Editing Filter Slides	2-8
2.3.2.1	Adding Filter Slides	2-9
2.3.2.2	Configuring Filter Slides	2-9
2.3.2.3	Removing Filter Slides	2-10
2.3.2.4	Exporting and Importing All Filter Slide Configurations	2-11
2.3.2.5	Exporting and Importing Individual Filter Slide Configurations	2-11
2.3.3	Manually Controlling the Instrument	2-12
2.3.3.1	Temperature Control (TRIAD only)	2-12
2.3.3.2	Shake Control	2-13
2.3.3.3	Plate Control	2-13
2.3.3.4	Excitation and Emission Filter Slide Control	2-13

3 Setting Up and Using Signet

3.1	Overview	3-1
3.2	Setting Up Signet	3-2
3.2.1	Changing the Administrator Password	3-2
3.2.2	Setting the Signet Support Level	3-3
3.3	Performing System Administration Tasks	3-5
3.3.1	Administering User Accounts and Roles	3-5
3.3.1.1	Configuring Roles for Concert - TRIAD Series Software User Accounts	3-7
3.3.2	Restoring the Administrator Password	3-9
3.3.3	Viewing the System Activity Audit Log	3-10
3.4	Performing Signet User Actions in Concert - TRIAD Series Software	3-11
3.4.1	Logging On and Off the System	3-12
3.4.1.1	Logging On the System	3-12
3.4.1.2	Logging Off the System	3-13
3.4.1.3	Handling Disabled Accounts	3-13
3.4.2	Changing the Password of the User Currently Logged Into the System	3-14
3.4.3	Viewing and Searching the Concert - TRIAD Series Software Audit Log	3-15
3.4.4	Reactivating Disabled Message Boxes	3-16

3.4.5	Adding Electronic Signatures and Comments to Items	3-17
3.4.5.1	Signing Items	3-18
3.4.5.2	Viewing or Unlocking Signatures for an Item	3-19
3.4.5.3	Viewing Unlocked Signatures	3-20

4 Creating and Editing Detection Methods

4.1	Overview	4-1
4.2	Creating Detection Methods	4-3
4.2.1	Selecting a Method Technique	4-4
4.2.2	Selecting the Method Type	4-5
4.2.3	Defining Method Parameters	4-6
4.2.3.1	Defining Absorbance Method Parameters	4-6
4.2.3.2	Defining Luminescence Method Parameters	4-7
4.2.3.3	Defining Fluorescence Intensity Top Method Parameters	4-8
4.2.3.4	Defining Fluorescence Intensity Bottom Method Parameters (TRIAD only)	4-9
4.2.3.5	Defining Fluorescence Polarization Method Parameters (TRIAD only)	4-11
4.2.3.6	Defining Time-Resolved Fluorescence Method Parameters (TRIAD only)	4-12
4.2.4	Signing a Detection Method	4-13
4.3	Editing Detection Methods	4-14
4.4	Copying Detection Methods	4-16
4.5	Deleting Detection Methods	4-17
4.6	Exporting and Importing Detection Methods	4-18

5 Creating and Editing Labware

5.1	Overview	5-1
5.2	Creating Labware	5-3
5.2.1	Defining Labware Information	5-4
5.2.1.1	General Labware Selection Guidelines	5-6
5.2.2	Configuring Offsets and Well Dimensions for the Default Labware Lot	5-7
5.2.3	Signing Labware	5-8
5.3	Editing Labware	5-9
5.3.1	Viewing and Editing Labware Information	5-10
5.3.2	Selecting and Editing Labware Lots	5-11
5.4	Copying Labware	5-12
5.5	Deleting Labware	5-13

5.6	Optimizing Labware	5-14
5.6.1	Selecting the Detection Method	5-15
5.6.2	Preparing and Loading the Labware	5-16
5.6.3	Performing the Optimization Read	5-17
5.6.4	Selecting the Centers of the Four Corner Wells	5-18
5.6.5	Verifying Well Centers	5-19
5.7	Exporting and Importing Labware	5-21

6 Creating Protocols

6.1	Overview	6-1
6.2	Creating Basic and Analysis Protocols	6-3
6.2.1	Configuring General Settings	6-5
6.2.2	Selecting the Technique Type	6-7
6.2.3	Selecting the Labware Type Used in the Protocol	6-8
6.2.4	Configuring Labware Layout Settings	6-9
6.2.4.1	Configuring the Sample Layout for Basic Applications. . .	6-9
6.2.4.2	Configuring the Sample Layout for Analysis Applications	6-11
6.2.4.3	Configuring Reading Direction	6-14
6.2.5	Configuring Detection and Preparation Methods	6-15
6.2.5.1	Configuring a Method in Basic Mode	6-16
6.2.5.2	Configuring a Method in Advanced Mode	6-23
6.2.6	Configuring Variables (Concert - TRIAD Series Analysis Software only)	6-31
6.2.7	Configuring a Transformation Formula (Concert - TRIAD Series Analysis Software only)	6-32
6.2.8	Configuring Concentration (Concert - TRIAD Series Analysis Software only)	6-33
6.2.9	Configuring Cutoff Values (Concert - TRIAD Series Analysis Software only)	6-38
6.2.10	Configuring Validation Rules (Concert - TRIAD Series Analysis Software only)	6-40
6.2.11	Configuring Output Settings	6-42
6.2.11.1	Configuring a Program to Execute after a Protocol Run Completes	6-44
6.2.12	Signing a Protocol	6-45
6.3	Running Protocols	6-46
6.3.1	Running a Protocol on an Instrument	6-46
6.3.1.1	Optimizing Read Height (TRIAD only)	6-48
6.3.2	Running a Protocol When Simulation Mode is Enabled	6-51
6.4	Editing Protocols	6-53
6.5	Copying Protocols	6-55
6.6	Deleting Protocols	6-56
6.7	Printing Protocol Configuration Information	6-57
6.8	Exporting and Importing Protocols	6-59

7 Viewing Measurement Results

7.1	Overview	7-1
7.2	Viewing Measurement Results in the Result Viewer	7-3
7.2.1	Viewing Raw Data	7-4
7.2.2	Viewing Reduced Data	7-5
7.2.3	Viewing Mean Data	7-6
7.2.4	Viewing Graphs	7-7
7.2.4.1	Viewing Two-Dimensional Graphs	7-8
7.2.4.2	Viewing Three-Dimensional Graphs	7-9
7.2.5	Recalculating Data Reduction	7-10
7.2.6	Exporting Measurement Results to Microsoft® Excel	7-12
7.2.7	Saving Measurement Results	7-12
7.3	Viewing and Reevaluating Results from an Analysis Application	7-14
7.3.1	Viewing Results From an Analysis Protocol	7-14
7.3.1.1	Changing the Standard Curve Graph View	7-15
7.3.2	Reevaluating Results from an Analysis Protocol	7-17
7.4	Viewing Exported Measurement Results	7-19
7.4.1	Viewing Measurement Results in Microsoft® Excel	7-19
7.4.1.1	Viewing Protocol and Measurement Information	7-20
7.4.1.2	Viewing Raw Data	7-21
7.4.1.3	Viewing Reduced and Transformed Data	7-22
7.5	Signing Measurement Results	7-23
7.6	Deleting Measurement Results	7-24
7.7	Printing Measurement Results	7-25

A Appendix A: Data Reduction Techniques

A.1	Supported Data Reduction Techniques	A-1
-----	---	-----

B Appendix B: Mathematical Operators and Functions

B.1	Supported Mathematical Operators and Functions	B-1
-----	--	-----

C Appendix C: Software Error Codes

C.1	Troubleshooting Software Error Codes	C-1
-----	--	-----

Index	xix
-------------	-----

List of Figures

Figure 1-1. Concert - TRIAD Series Software main window	1-3
Figure 1-2. Using online help	1-5
Figure 1-3. Starting the installation	1-8
Figure 1-4. Installing the software on a Windows NT® system	1-9
Figure 1-5. Repairing the installation	1-11
Figure 1-6. Concert - TRIAD Series Software main screen	1-12
Figure 1-7. Warning — Instrument is not connected	1-13
Figure 1-8. Instrument Selection List with simulated instrument selected.....	1-14
Figure 1-9. Configuring communications settings	1-15
Figure 1-10. Configuring Software Settings.....	1-16
Figure 1-11. Configuring Print Settings	1-17
Figure 1-12. Choosing the Simulated Data files.....	1-18
Figure 1-13. Choosing the directory where data is saved.....	1-19
Figure 2-1. Instrument Selection List	2-2
Figure 2-2. Instrument Settings — Basic Settings.....	2-7
Figure 2-3. Instrument Settings — Filter Slides	2-8
Figure 2-4. Configuring filter properties	2-9
Figure 2-5. Instrument Settings — Manual Control	2-12
Figure 3-1. Account Management	3-2
Figure 3-2. Support Options	3-4
Figure 3-3. Account Management	3-6
Figure 3-4. Configuring roles	3-7
Figure 3-5. Password Restore	3-9
Figure 3-6. Signet Audit Log.....	3-10
Figure 3-7. Accessing user actions	3-11
Figure 3-8. Logon	3-12
Figure 3-9. Administrator Notification.....	3-13
Figure 3-10. Changing the user password	3-14
Figure 3-11. Viewing records in the Audit Viewer	3-15
Figure 3-12. Activating disabled messages	3-16
Figure 3-13. Signing an item	3-17

Figure 3-14. Viewing active signatures	3-19
Figure 3-15. Viewing unlocked signatures	3-20
Figure 4-1. Accessing detection method actions	4-2
Figure 4-2. Selecting a Method Technique	4-4
Figure 4-3. Selecting an absorbance Method Type	4-5
Figure 4-4. Defining absorbance measurement parameters	4-6
Figure 4-5. Defining luminescence measurement parameters	4-7
Figure 4-6. Defining fluorescence intensity top method parameters	4-8
Figure 4-7. Defining fluorescence intensity bottom method parameters	4-9
Figure 4-8. Defining fluorescence polarization method parameters	4-11
Figure 4-9. Defining time-resolved fluorescence method parameters	4-12
Figure 4-10. Editing a fluorescence intensity top method	4-14
Figure 4-11. Confirming the deletion of a detection method	4-17
Figure 4-12. Choosing the folder where an exported detection method will be saved	4-18
Figure 5-1. Accessing labware actions	5-2
Figure 5-2. Defining plate dimensions and information	5-4
Figure 5-3. Defining offsets and well dimensions	5-7
Figure 5-4. Editing labware dimensions and well information	5-10
Figure 5-5. Configuring offsets and well dimensions in Labware Lots	5-11
Figure 5-6. Confirming a labware deletion	5-13
Figure 5-7. Selecting the detection method for labware optimization	5-15
Figure 5-8. Preparing the labware for optimization	5-16
Figure 5-9. Labware optimization in progress	5-17
Figure 5-10. Selecting the well center	5-18
Figure 5-11. Verifying well centers	5-19
Figure 5-12. Choosing the folder where exported labware will be saved	5-21
Figure 6-1. Protocol Selection List	6-2
Figure 6-2. Selecting the application type	6-4
Figure 6-3. Defining a protocol name and entering notes about the protocol	6-5
Figure 6-4. Selecting the measurement technique for a TRIAD	6-7
Figure 6-5. Selecting the type of labware used in the protocol	6-8
Figure 6-6. Configuring Layout Settings for a Basic application	6-9
Figure 6-7. Configuring Layout Settings for an Analysis application	6-11
Figure 6-8. Selecting how wells on the plate are read	6-14
Figure 6-9. Configuring a detection method in Method Selection	6-15
Figure 6-10. Configuring a method in basic mode	6-16
Figure 6-11. Selecting a data reduction method for a kinetic measurement	6-18
Figure 6-12. Configuring an area scan	6-20
Figure 6-13. Configuring a linear scan	6-21
Figure 6-14. Selecting a data reduction method for a scan method	6-22
Figure 6-15. Configuring a method in advanced mode	6-23
Figure 6-16. Adding a kinetic detection method	6-24
Figure 6-17. Configuring Loop Properties for a kinetic measurement	6-25
Figure 6-18. Selecting a data reduction method for the sequence	6-26
Figure 6-19. Configuring a Shake preparation method	6-28
Figure 6-20. Configuring a Set Temperature preparation method	6-29

Figure 6-21. Configuring variables in an analysis protocol.....	6-31
Figure 6-22. Configuring a transformation formula	6-32
Figure 6-23. Configuring concentration parameters.....	6-33
Figure 6-24. Configuring standards	6-36
Figure 6-25. Configuring standard curve validation parameters	6-37
Figure 6-26. Configuring cutoff values	6-38
Figure 6-27. Configuring validation rules	6-40
Figure 6-28. Configuring output settings.....	6-42
Figure 6-29. Configuring an external software application in Output Settings.....	6-44
Figure 6-30. Preparing to run a protocol on an instrument.....	6-46
Figure 6-31. Selecting the detection method used in the read height optimization.....	6-48
Figure 6-32. Selecting the well read in the read height optimization	6-49
Figure 6-33. Read height optimization in progress.....	6-50
Figure 6-34. Read height optimization completed.....	6-50
Figure 6-35. Preparing to run a protocol in simulation mode.....	6-51
Figure 6-36. Editing an absorbance protocol.....	6-53
Figure 6-37. Confirming the deletion of a protocol.....	6-56
Figure 6-38. Previewing a protocol configuration and sample layout printout	6-58
Figure 6-39. Choosing the folder where an exported protocol will be saved	6-59
Figure 7-1. Accessing measurement result actions.....	7-1
Figure 7-2. Viewing results of an area scan measurement	7-3
Figure 7-3. Viewing raw data for an area scan measurement.....	7-4
Figure 7-4. Viewing reduced data for a measurement performed in a multiwavelength protocol	7-5
Figure 7-5. Viewing mean data for a fluorescence polarization measurement.....	7-6
Figure 7-6. Viewing kinetic measurement graphs	7-7
Figure 7-7. Viewing a two-dimensional absorbance graph	7-8
Figure 7-8. Viewing a three-dimensional area scan graph	7-9
Figure 7-9. Changing data reduction parameters in the Results Viewer	7-10
Figure 7-10. Selecting a data reduction method for the sequence	7-11
Figure 7-11. Choosing to overwrite existing measurement results	7-12
Figure 7-12. Entering a new name for saved results.....	7-13
Figure 7-13. Saving parameters edited in the Result Viewer to the protocol.....	7-13
Figure 7-14. Viewing existing transformation parameters in the Results Viewer.....	7-14
Figure 7-15. Viewing existing transformation parameters in the Results Viewer.....	7-17
Figure 7-16. Editing transformation parameters in the Results Viewer	7-18
Figure 7-17. Viewing protocol information in the General worksheet (excerpt)	7-20
Figure 7-18. Viewing raw data (excerpt).....	7-21
Figure 7-19. Viewing reduced data (excerpt)	7-22
Figure 7-20. Confirming the deletion of measurement results	7-24
Figure 7-21. Previewing a measurement results printout	7-25

List of Tables

Table 1-1. Host Computer System Requirements	1-6
Table 2-1. Basic Settings Read-Only Fields	2-7
Table 3-1. Concert - TRIAD Series Software Permissions	3-8
Table 3-2. Concert - TRIAD Series Software Default Roles.....	3-8
Table 3-3. Audit Log Actions	3-16
Table 5-1. General Microplate selection guidelines	5-6
Table 6-1. Curve Fitting Methods.....	6-34
Table 6-2. Example test validation formulas	6-41
Table 6-3. Output Options	6-43
Table 7-1. Measurement Results Search Options	7-2
Table 7-2. Well Status Indicators	7-4
Table 7-3. Measurement Results Tabs Displayed for Analysis Options	7-15
Table 7-4. Standard Curve Graph View Options.....	7-16
Table A-1. Scan Measurement and Sequence Data Reduction Techniques	A-1
Table A-2. Kinetic Data Reduction Techniques	A-2
Table A-3. Fluorescence Polarization Data Reduction Techniques (TRIAD only)	A-3
Table B-1. Mathematical and Logical Operators.....	B-1
Table B-2. Mathematical Functions.....	B-2
Table C-1. Software Error Codes and Solutions.....	C-1



Installing, Setting Up, and Using the Software

1.1 Overview

Concert - TRIAD Series Software configures and controls all measurement protocols and actions performed by the TRIAD LT and TRIAD Multimode Detectors. The software supports performing absorbance, glow luminescence, fluorescence intensity (top and bottom), fluorescence polarization, and time-resolved fluorescence (TRF) measurements. The measurement methods available to users depend on the capabilities of the instrument being controlled. Measurement results may be viewed in Concert - TRIAD Series Software or easily exported to compatible applications such as Microsoft® Excel.

Optional modules may be purchased separately to extend the functionality of the software. Available modules include Concert - TRIAD Series Analysis Software, which provides advanced protocol configuration and evaluation capabilities and Concert - TRIAD Series Analysis Software with Signet, which adds support for electronic signature regulations such as 21 CFR Part 11.

The simple interface divides the main window into three basic sections, which provide easy access to system functionality. Most operations use a wizard-type interface to efficiently guide the task being performed.

This user's manual covers the functionality provided by Concert - TRIAD Series Software, and the optional Concert - TRIAD Series Analysis Software and Concert - TRIAD Series Analysis Software with Signet modules, including:

- [Setting Up and Controlling Instruments](#) (Chapter 2).
- [Setting Up and Using Signet](#) (Chapter 3).
- [Creating and Editing Detection Methods](#) (Chapter 4).
- [Creating and Editing Labware](#) (Chapter 5).
- [Creating Protocols](#) (Chapter 6).
- [Viewing Measurement Results](#) (Chapter 7).

This chapter introduces users to the software and provides instructions for:

- [Using Concert - TRIAD Series Software](#) (Section 1.2).
- [Installing Concert - TRIAD Series Software](#) (Section 1.3).
- [Setting Up Concert - TRIAD Series Software](#) (Section 1.4).

1.2 Using Concert - TRIAD Series Software

Concert - TRIAD Series Software uses a simple interface that divides the main window into three basic sections: navigation pane, toolbar, and selection and configuration pane (Figure 1-1). The interface includes easy access to the selection lists that provide system functionality and a comprehensive, context-sensitive online help system.

This section covers:

- [*Launching the Software*](#) (Section 1.2.1).
- [*Using the Software Interface*](#) (Section 1.2.2).
- [*Accessing Online Help*](#) (Section 1.2.3).

1.2.1 Launching the Software

To launch Concert - TRIAD Series Software:

From the Windows® Start menu, choose **Programs>Dynex Technologies>Concert - TRIAD Series>Concert - TRIAD Series**. Concert - TRIAD Series Software appears (Figure 1-1).

Note: If Concert - TRIAD Series Software is not found in the Start menu, the software may have been installed for a single user account on the system instead of all accounts. Check with the site system administrator or login to the user account with permission to access the software. Refer to Section 1.3.2, [Installing Concert - TRIAD Series Software on Windows® 2000 or XP](#), for more information about installing the software for a single or multiple user accounts.

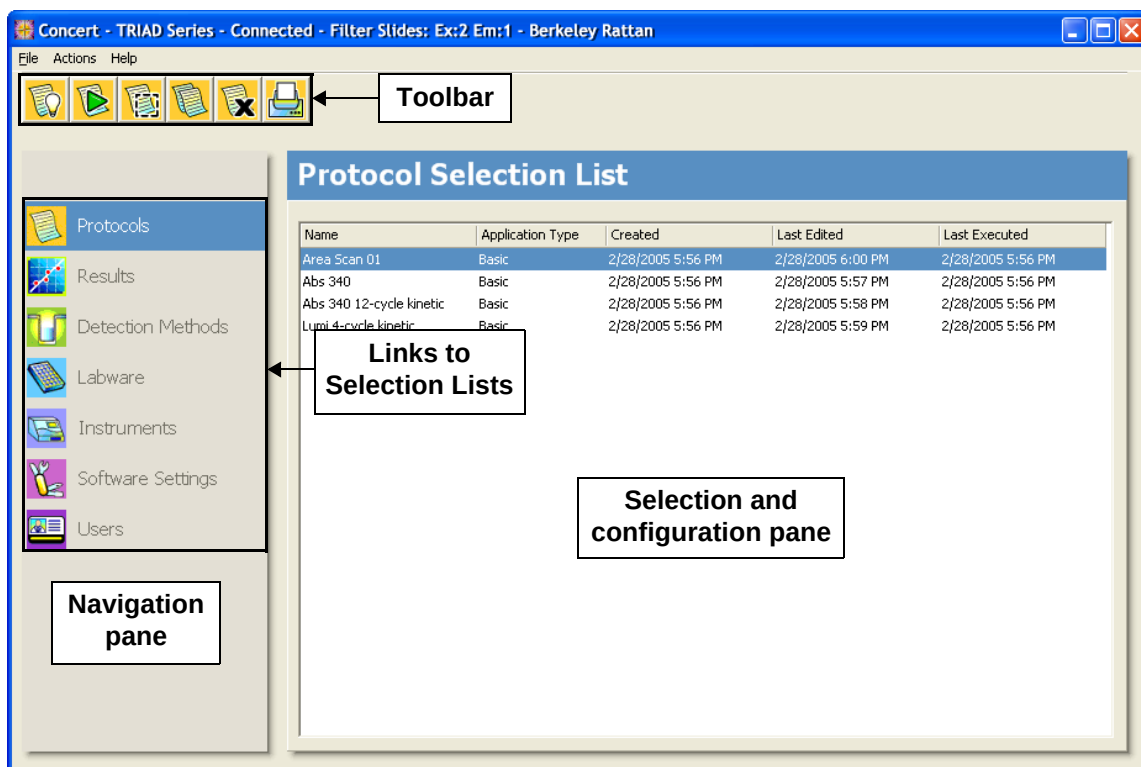


Figure 1-1. Concert - TRIAD Series Software main window

1.2.2 Using the Software Interface

Concert - TRIAD Series Software uses a simple interface that is divided into three basic sections:

- navigation pane (refer to Section 1.2.2.1, [About the Navigation Pane](#)).
- toolbar (refer to Section 1.2.2.2, [About the Toolbar](#)).
- selection and configuration pane (refer to Section 1.2.2.3, [About the Selection and Configuration Pane](#)).

The navigation pane provides access to the selection lists that provide the majority of the functionality built into the software. The options available in the toolbar and configuration pane are determined by the selection list currently selected in the navigation pane.

1.2.2.1 About the Navigation Pane

The navigation pane is the narrow pane on the left of the Concert - TRIAD Series Software window (Figure 1-1). Use the navigation pane to switch between selection lists:

- **Protocols** — opens the Protocol Selection List and provides the ability to define, run, edit, copy, delete, and print measurement protocols (refer to Chapter 6, [Creating Protocols](#)).
- **Results** — opens the Results Selection List and provides the ability to view saved measurement results and modify data reduction parameters in the Result Viewer. When the optional Concert - TRIAD Series Analysis Software module is installed, measurement results may be reevaluated using parameters different from those configured in the original protocol (refer to Chapter 7, [Viewing Measurement Results](#)).
- **Labware** — opens the Labware Selection List and provides the ability to create, edit, optimize, copy, and delete labware types (refer to Chapter 5, [Creating and Editing Labware](#)).
- **Detection Methods** — opens the Detection Method Selection List and provides the ability to create, edit, copy, and delete detection methods (refer to Chapter 4, [Creating and Editing Detection Methods](#)).
- **Instruments** — opens the Instrument Selection List and provides the ability to manually control instrument actions, such as shaking, and configure communications settings and filter slides (refer to Chapter 2, [Setting Up and Controlling Instruments](#)).
- **Software Settings** — configures software settings, including system language, print options, default simulated data files, and the directory where measurement results are saved (refer to Section 1.4.2, [Configuring Software Settings](#)).
- **Users** — appears in the navigation pane only when the optional Concert - TRIAD Series Analysis Software with Signet module is installed and enabled on the system. Signet is an integrated set of features that help Concert - TRIAD Series Software users comply with electronic signature regulations, such as 21 CFR Part 11 (refer to Section 3.4, [Performing Signet User Actions in Concert - TRIAD Series Software](#)).

1.2.2.2 About the Toolbar

The toolbar provides easy access to common software actions. The module chosen in the navigation pane determines which actions are available on the toolbar; for example, Optimize Labware is only available when the Labware module is active.

1.2.2.3 About the Selection and Configuration Pane

The selection and configuration pane is the large pane to the right of the navigation pane. Options available in this pane change depending on which module is currently selected in the navigation pane. For example, when Protocols is selected, the Protocol Selection List is displayed, which provides access to configured protocols and functionality specific to the Protocols module.

1.2.3 Accessing Online Help

Concert - TRIAD Series Software contains a detailed online help system that covers defining and editing labware, detection methods, and protocols, performing measurements, and exporting measurement results. The online help is context sensitive, which provides instant access to help for the active screen.

To access online help:

Press **F1** at any time to display online help for the active screen (Figure 1-2).

OR

From the Help menu, choose **Help** to display the table of contents.

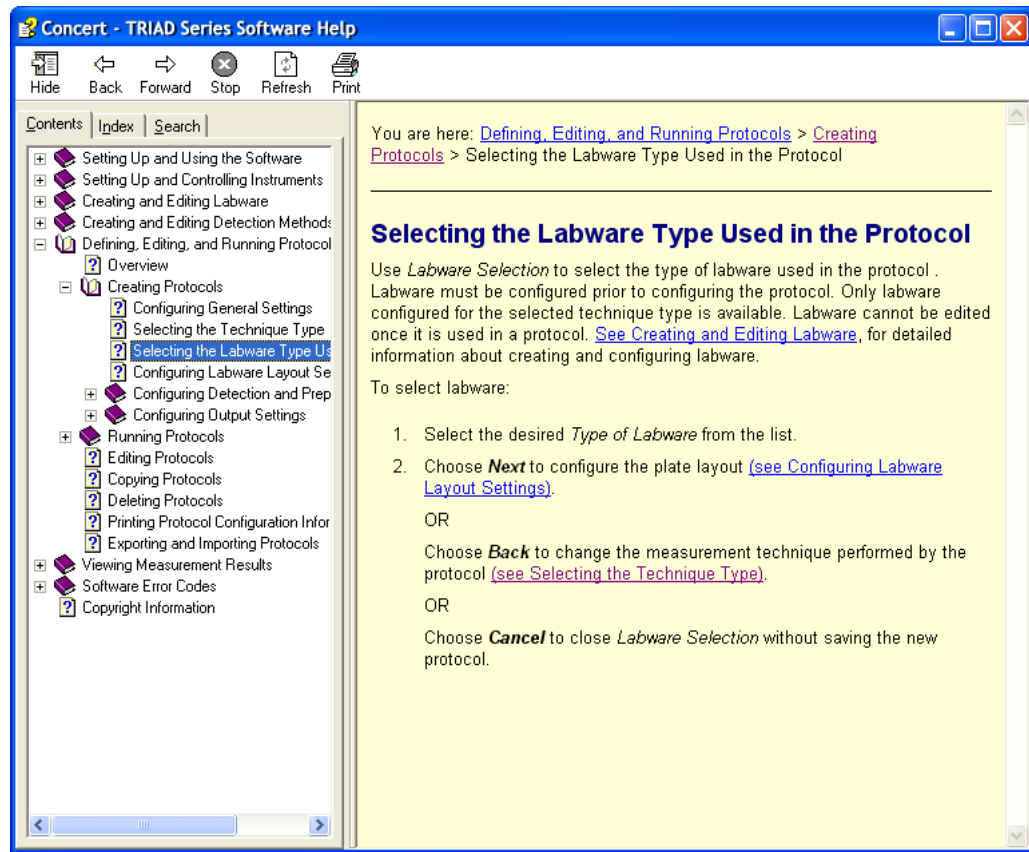


Figure 1-2. Using online help

1.3 Installing Concert - TRIAD Series Software

The Concert - TRIAD Series Software installer provides the ability to install the software on a new system.

Installing the software requires:

- [Meeting System Requirements](#) (Section 1.3.1).
- [Installing Concert - TRIAD Series Software on Windows® 2000 or XP](#) (Section 1.3.2).

OR

- [Installing Concert - TRIAD Series Software on Windows NT®](#) (Section 1.3.3).

Note: The installation procedure varies depending on the operating system in use on the target system. Follow the instructions in the appropriate section to install the software.

- [Installing Optional Modules](#) (Section 1.3.4).

1.3.1 Meeting System Requirements

To install and use the software successfully, the host computer must meet the minimum system requirements listed in Table 1-1. Where relevant, Table 1-1 also lists recommended specifications.

Table 1-1. Host Computer System Requirements

Component	Minimum Requirements
CPU	Pentium® II 300 Mhz
RAM	128 MB minimum 256 MB recommended
Hard Drive	300 MB free space
CD-ROM Drive	4X
Monitor	800x600 resolution
Keyboard	101 key
Mouse	IBM® compatible
Serial Port	1 free serial port
Operating Systems	Windows NT® 4 (Service Pack 6a) Windows® 2000 (Service Pack 1) Windows® XP (Service Pack 1)

Table 1-1. Host Computer System Requirements

Component	Minimum Requirements
Operating System Language	English (U.S.)
Database	Microsoft SQL Server 8.0 (Personal Edition included on the installation CD) Note: The storage limit for SQL Server Personal Edition is 2GB. Contact DYNEX Technologies Sales or Customer Technical Support if more storage is required.
Web Browser	Internet Explorer 6.0 or later (included on the installation CD)

1.3.2 Installing Concert - TRIAD Series Software on Windows® 2000 or XP

On a Windows® 2000 or XP system, the Concert - TRIAD Series Software installer uses a simple interface to guide the installation of the software and required components.

To install the verification plate software:

1. Exit all Windows programs before running the setup program.
2. Make sure the current user account has Administrator privileges. Accounts with Standard or Restricted access are not permitted to run the setup program. Contact the site system administrator for more information about account privileges.
3. Insert the installation CD into the CD-ROM drive and browse to the contents of the CD.
4. In the contents of the CD, open **Begin here for XP or W2K systems**.
5. In **Begin here for XP or W2K systems**, double-click **Installer.exe**. Concert - TRIAD Series Software Installer appears (Figure 1-3). All components required to successfully install the software are listed. The current status of each required component is listed:



- a check icon indicates the correct version of the component is already installed on the system.



- a caution icon indicates that an older version of the component is installed and must be updated before the software may be installed.



- an X icon indicates that the component must be installed before the software may be installed.

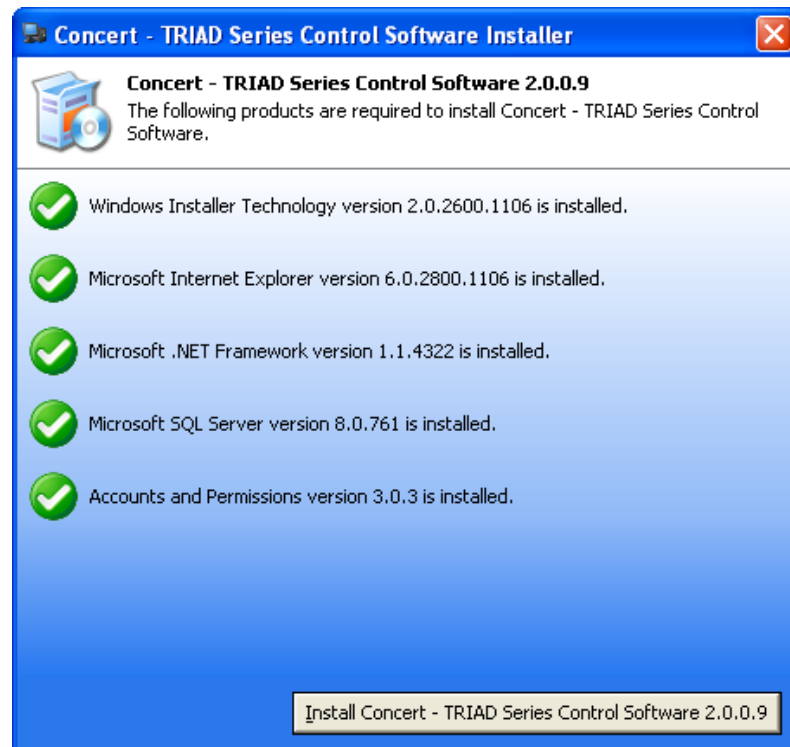


Figure 1-3. Starting the installation

6. Choose **Update** or **Install** for the first component indicated. Components are installed one at a time and should be installed in the order listed.
7. Follow the steps in the component installer until the component installation is complete.

Note: If a component installation requires restarting the system, restart before installing the next component listed. After the system restarts, browse to the contents of the installer CD and launch the installer again to continue installing components.

8. Repeat steps 6 and 7 for each component required. When all components are installed properly, the Install Concert - TRIAD Series Software button activates.
9. Choose Install Concert - TRIAD Series Software to launch the software installation wizard and follow the steps in the wizard.
10. In Concert - TRIAD Series Software Installer, choose **Finish**. The software is now ready for use.

1.3.3 Installing Concert - TRIAD Series Software on Windows NT®

When installing the software on a Windows NT® system, required components that must be installed before the software are selected manually from a link on a web page (Figure 1-4).

To install the verification plate software:

1. Exit all Windows programs before running the setup program.
2. Make sure the current user account has Administrator privileges. Accounts with Standard or Restricted access are not permitted to run the setup program. Contact the site system administrator for more information about account privileges.
3. Insert the installation CD into the CD-ROM drive and browse to the contents of the CD.
4. In the contents of the CD, open **Begin here for NT systems**.
5. In **Begin here for NT systems**, double-click **Installer.htm**. Concert - TRIAD Series Software opens in a web browser window (Figure 1-4). A series of links lists all of the components that must be installed to enable the verification plate.

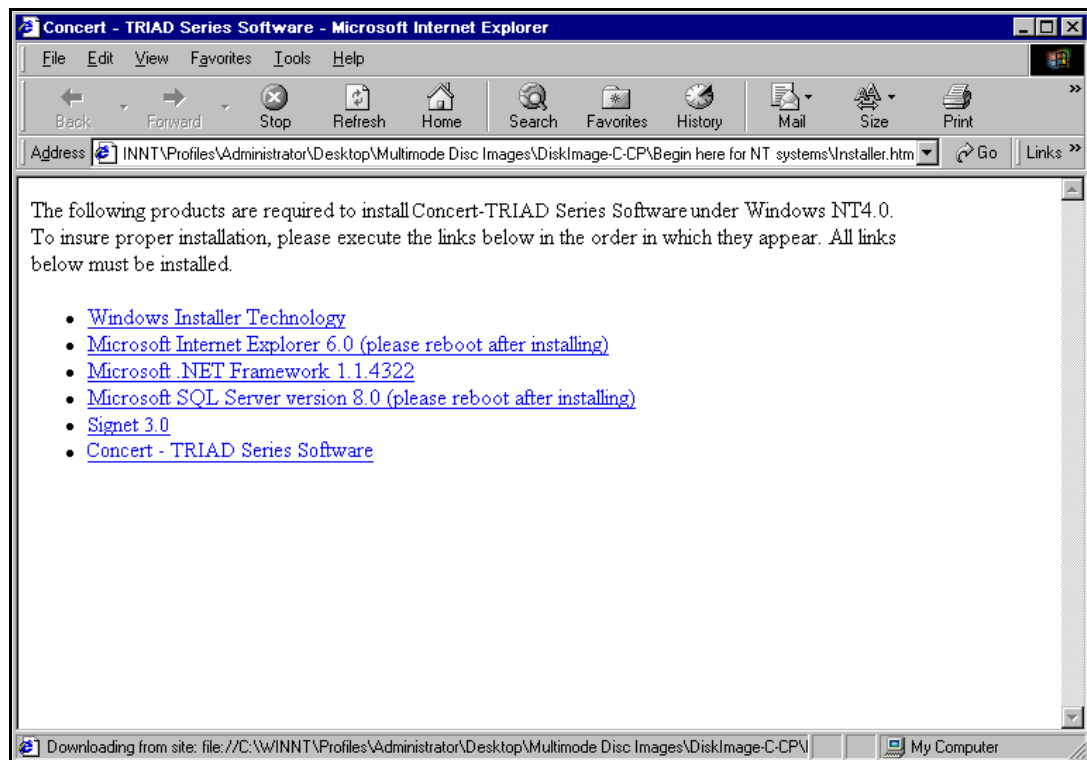


Figure 1-4. Installing the software on a Windows NT® system

6. Click on a link to launch the installer for that component. During installation, keep in mind that:
 - the components must be installed in the order listed.
 - when an installer requires restarting the computer, the computer must be restarted before installing the next component in the list.

Note: After the system restarts, browse to the contents of the installer CD and open **Installer.htm** again to continue installing components.

Note: If a prompt to Run or Save the installer appears before the installation wizard, choose **Run** to start the wizard.

7. Follow the steps in the component installer until the installation is complete.
8. Repeat steps 6 and 7 until all components and Concert - TRIAD Series Software are installed. The software is now ready for use.

1.3.4 Installing Optional Modules

Optional modules that extend the functionality of Concert - TRIAD Series Software may be purchased separately and installed on the system. Optional modules use an installation system that is nearly identical to the Concert - TRIAD Series Software installer.

To install an optional module:

1. Exit all Windows programs.
2. Make sure the user currently logged into Windows has Administrator privileges. Accounts with Standard or Restricted access are not permitted to install the software. Contact the site system administrator for more information about account privileges.
3. Insert the module installation CD into the CD-ROM drive and browse to the contents of the CD.
4. If installing the module on a Windows® XP or 2000 system, open **Begin here for XP or W2K systems**. The module installer appears.

OR

If installing the module on a Windows NT® system, open **Begin here for NT systems**. A list of components that must be installed appears in a web browser window.

5. If installing on a Windows® XP or 2000 system, **Install** or **Update** each required component listed as such, then install the module.

OR

If installing on a Windows NT® system, install the required components in the order listed, then install the module.

1.3.5 Repairing or Removing the Concert - TRIAD Series Software Installation

The Concert - TRIAD Series Software installation may be repaired if required components are missing or damaged. Try repairing the installation if the software will not open or does not run correctly. The software may also be removed (uninstalled) from the system. Repair and removal options are accessed from the Add or Remove Programs control panel in Windows.

To repair or remove the software:

1. Exit all open Windows programs.
2. Make sure the current user account has Administrator privileges. Accounts with Standard or Restricted access are not permitted to modify or remove software. Contact the site system administrator for more information about account privileges.
3. If repairing the installation, insert the Concert - TRIAD Series Software installation CD into the CD-ROM drive.
4. From the Start menu, choose **Settings>Control Panel**. Control Panel appears.
5. In Control Panel, choose **Add or Remove Programs**. Add or Remove Programs appears.
6. In Add or Remove Programs, choose **Multimode Detection Software**. Repair and removal options for the software appear.
7. To repair the installation, choose **Click here for support information**. Support Info appears (Figure 1-5). Proceed to step 8.

OR

To remove the software, choose **Remove** and follow the onscreen instructions until the removal process is finished.

Note: When removing the software, only files installed during the initial installation are removed. The software database and files created after the installation, such as exported measurement results, remain.

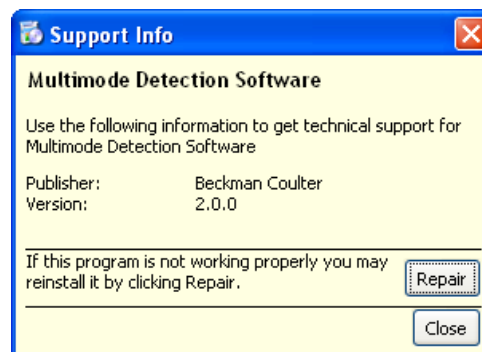


Figure 1-5. Repairing the installation

8. In Support Options, choose **Repair** to search for and automatically reinstall any missing or damaged files required to run the software.
9. When the repair is complete, choose **Close**.

1.4 Setting Up Concert - TRIAD Series Software

After installing the software and physically connecting the instrument to a serial port on the host computer, communications and software settings must be set up.

Setting up the software includes:

- [Configuring Communication Settings](#) (Section 1.4.1).
- [Configuring Software Settings](#) (Section 1.4.2).

To set up Concert - TRIAD Series Software:

1. From the Windows® Start menu, choose **Programs>Dynex Technologies>Concert - TRIAD Series>Concert - TRIAD Series**. Concert - TRIAD Series Software appears (Figure 1-6).

Note: If Concert - TRIAD Series Software is not found in the Start menu, the software may have been installed for a single user account on the system instead of all accounts. Check with the site system administrator or login to the user account with permission to access the software. Refer to Section 1.3.2, [Installing Concert - TRIAD Series Software on Windows® 2000 or XP](#), for more information about installing the software for a single or multiple user accounts.

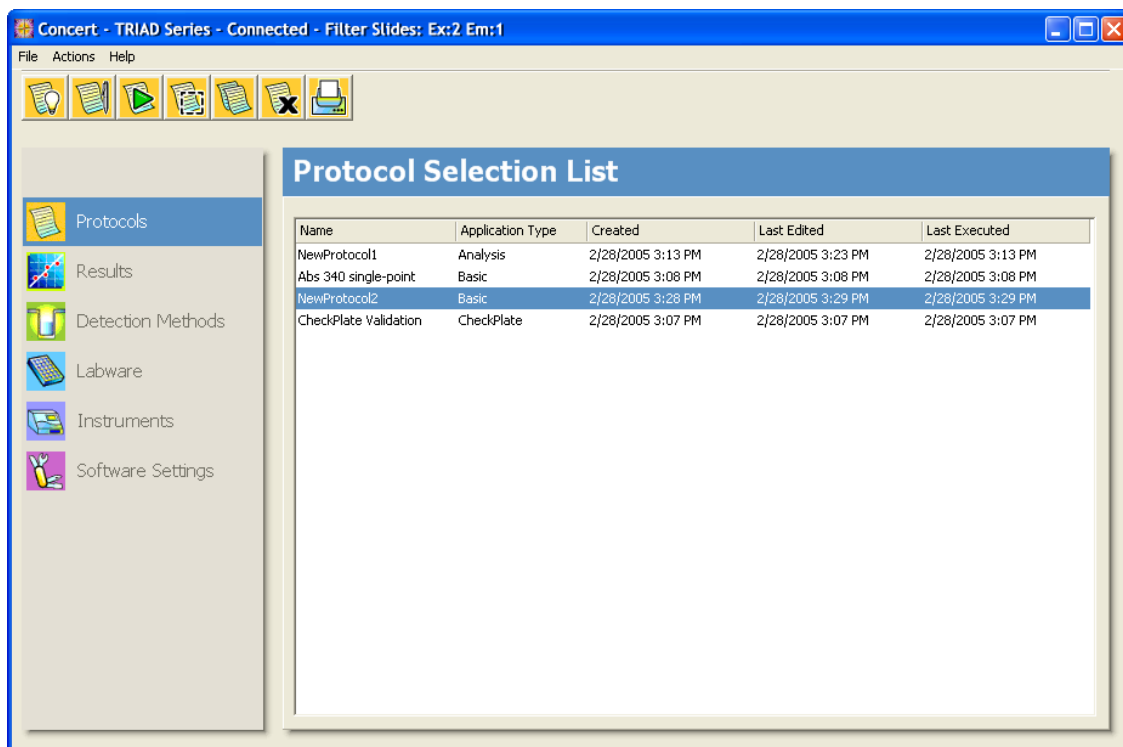


Figure 1-6. Concert - TRIAD Series Software main screen

2. If the Protocol Selection List (Figure 1-6) appears immediately, the instrument was automatically detected by the software. Proceed to Section 1.4.2, [Configuring Software Settings](#), to configure system settings.

OR

If Warning appears (Figure 1-7), the instrument was not detected by the software. Choose **OK** to work in simulation mode until the communications settings are configured properly.

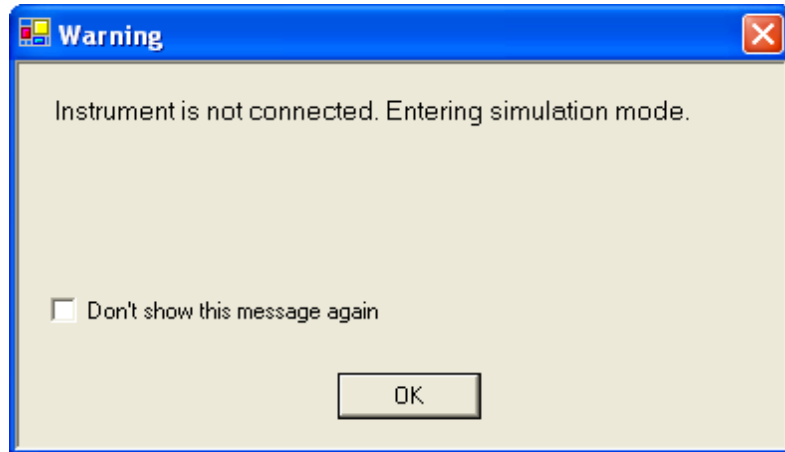


Figure 1-7. Warning — Instrument is not connected

3. If the instrument was not detected, configure the communications settings following the steps in Section 1.4.1, [Configuring Communication Settings](#).
4. Configure system settings, such as printing options, following the steps in Section 1.4.2, [Configuring Software Settings](#).

1.4.1 Configuring Communication Settings

After physically connecting the instrument to a serial communications port on the host computer, the selected serial port and communication speed must be configured correctly before Concert - TRIAD Series Software can control instrument actions. Communication settings are configured in Instrument Settings.

Before communication with an instrument is configured, a simulated instrument appears in the Instrument Selection List (Figure). When communication is configured correctly and the instrument is detected by the software, the simulated instrument is replaced in the list by the connected instrument.

Note: When Signet is enabled on the system, only users assigned a role containing the Instrument Settings permission may configure instrument settings. Refer to Section 3.3.1.1, [Configuring Roles for Concert - TRIAD Series Software User Accounts](#), for more information about roles and permissions.

To configure communications settings:

1. From the navigation pane, choose **Instruments**. The Instrument Selection List appears (Figure).

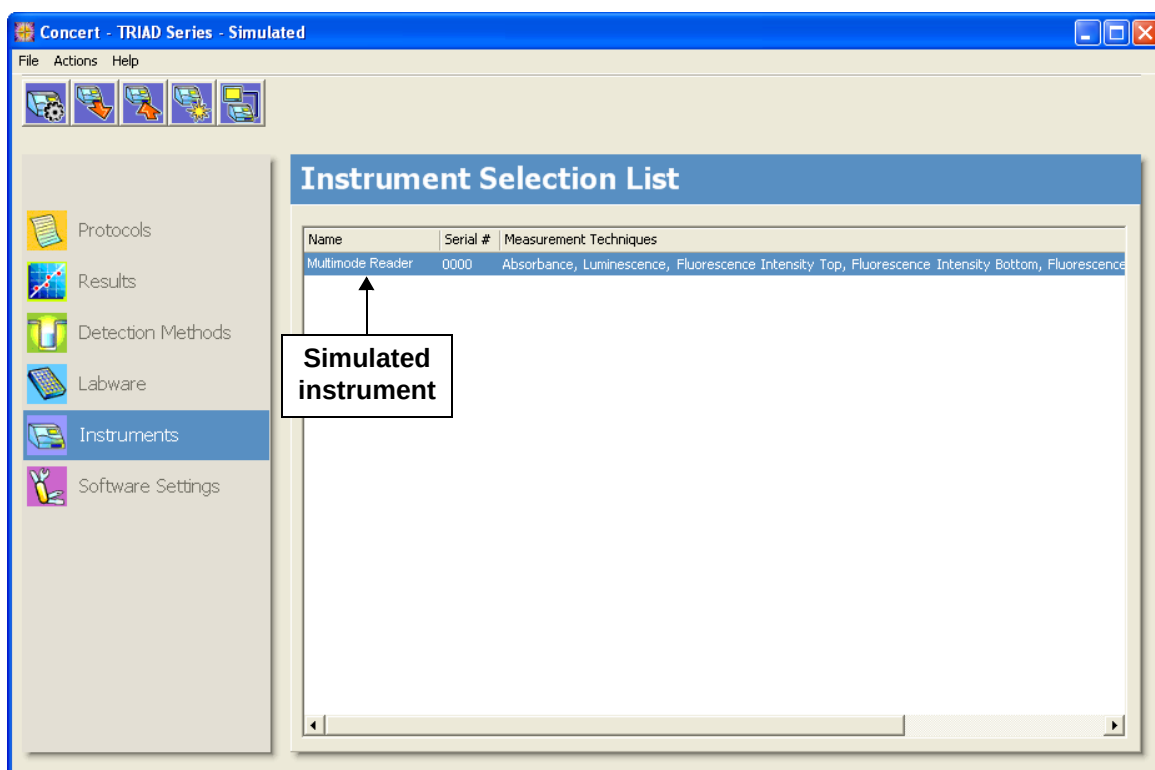


Figure 1-8. Instrument Selection List with simulated instrument selected



2. From the toolbar, choose **Instrument Settings**. Instrument Settings appears (Figure 1-9).

OR

From the Actions menu, choose **Instrument Settings**.

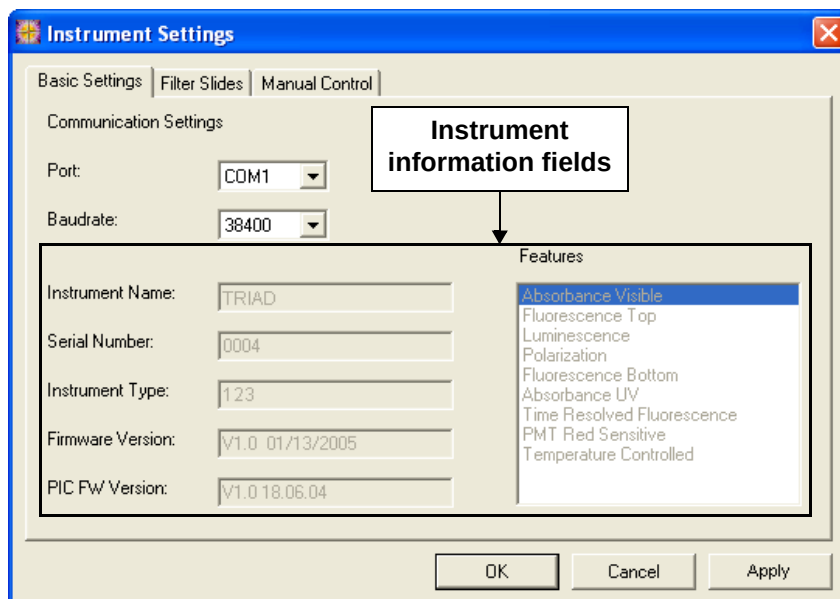


Figure 1-9. Configuring communications settings

3. Select the **Basic Settings** tab, if necessary.
4. In **Port**, select the serial communications port on the host computer that connects to the instrument.
5. In **Baudrate**, select **38400**.
6. Choose **Apply** to detect the instrument. When the instrument is detected, the instrument information fields are autopopulated with information about the connected instrument. Refer to Table 2-1 for more information about each field.
7. Choose **OK** to close Instrument Settings.

1.4.2 Configuring Software Settings

Concert - TRIAD Series Software can be customized using the options available in Software Settings (Figure 1-10). Use the tabs in Software Settings to configure printout options, default simulated data files, and the directory where measurement results are stored.

To configure Software Settings:

1. From the navigation pane, choose **Software Settings**. Software Settings appears (Figure 1-10).

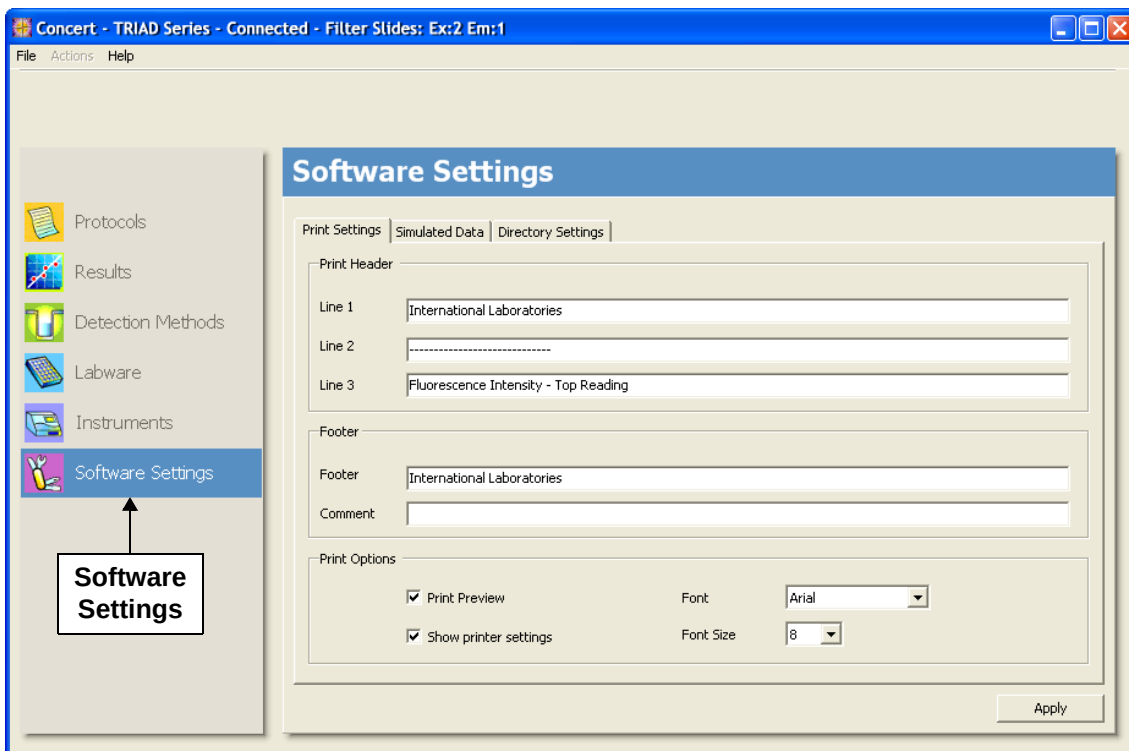


Figure 1-10. Configuring Software Settings

2. Configure the settings in the desired tab(s):
 - [Configuring Print Settings](#) (Section 1.4.2.1).
 - [Choosing Simulated Data Files](#) (Section 1.4.2.2).
 - [Choosing the Directory Where Exported Measurement Results are Saved](#) (Section 1.4.2.3).

1.4.2.1 Configuring Print Settings

Measurement results and protocol configurations may be printed. Printing parameters, such as headers and footers are configured in the **Print Settings** tab (Figure 1-11).

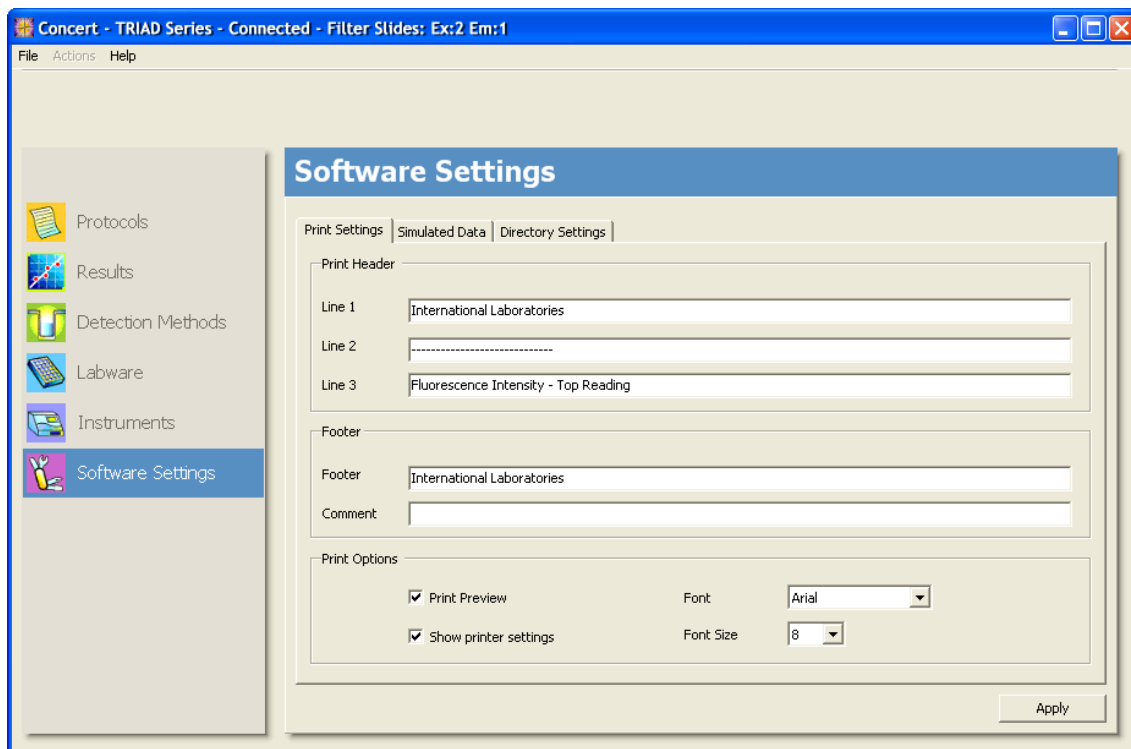


Figure 1-11. Configuring Print Settings

To configure print settings:

1. Choose the **Print Settings** tab. Print Settings appears (Figure 1-11).
2. In **Print Header**, enter text for each header **Line**, as desired. Header lines may be left blank.
3. In **Footer**, enter text for the **Footer** and **Comment**, as desired. The comment appears on printed pages below the footer. The footer and comment may be left blank.
4. In **Print Options**, select **Print Preview** to preview the page layout onscreen each time a protocol configuration or measurement results are printed.
5. In **Print Options**, choose **Show printer settings** to display printing options each time a protocol or measurement results are printed.
6. In **Print Options**, select the desired **Font** and **Font Size** for printed text.
7. Choose **Apply** to save the new print settings.

1.4.2.2 Choosing Simulated Data Files

Protocols may be run in simulation mode, which allows the protocol configuration to be tested using simulated data before performing the protocol on actual samples. In simulation mode, all features for the instrument type currently selected in the Instrument Selection List are available, but measurement results are either randomly generated by the software or read from a data file.

Use **Simulated Data** to choose the default data files for simulated absorbance, luminescence, and fluorescence measurements (Figure 1-12).

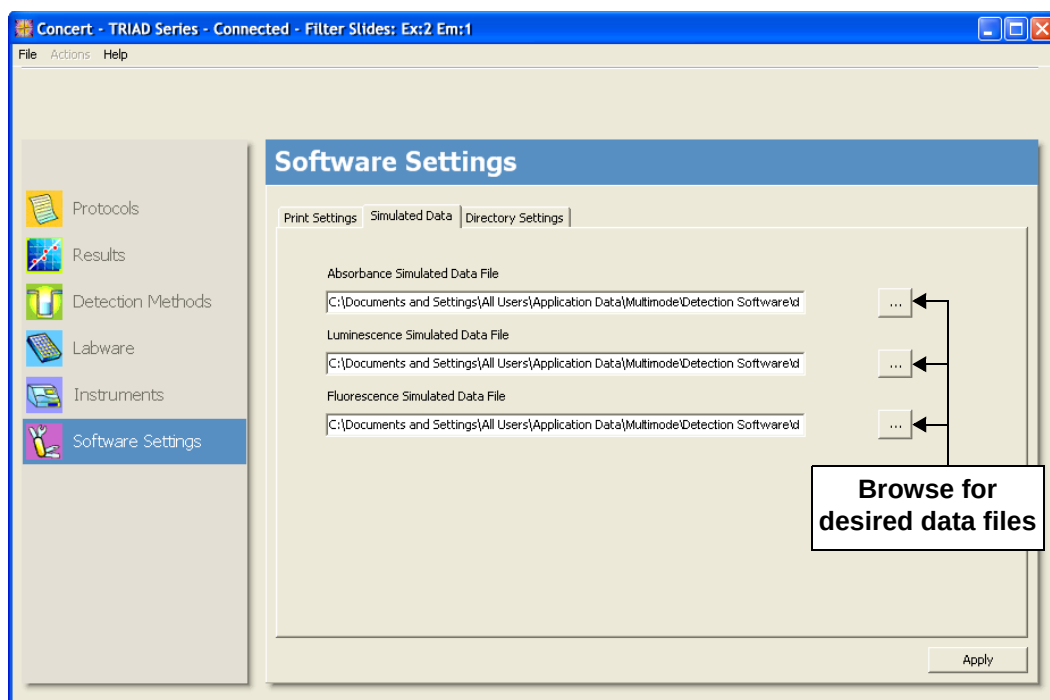


Figure 1-12. Choosing the Simulated Data files

To choose different simulated data files:

1. Choose the **Simulated Data** tab. Simulated Data appears (Figure 1-12).
2. In the desired field, enter the full path to the new simulated data file; for example, **c:\detection software templates\DefaultSimulatedData.dat**. Any data file with a .dat extension may be selected, including prior measurement results. Proceed to step 5.

OR

Choose the **Browse** button next to the desired measurement type. **Open** appears.

Note: Simulated data files are used when the number of measurement points in the simulated protocol run is the same as those present in the data file. When the number of measurement points is different, the software generates random data.

3. In **Open**, browse to desired data file. Any data file with a .dat extension may be selected, including prior measurement results.

4. Choose **Open** to select the data file and return to Software Settings.

OR

Choose **Cancel** to close Open without selecting a different data file.

5. Repeat steps 2 – 4 for each simulated data file desired to change.

6. Choose **Apply** to set the new default data file(s).

1.4.2.3 Choosing the Directory Where Exported Measurement Results are Saved

Exported measurement results files, regardless of format, are saved in a single directory. The default storage directory is C:\Documents and Settings\All Users\Application Data\Multimode\Detection Software\data\.. Use Directory Settings to change the storage directory, if desired (Figure 1-13).

Note: All measurement results are also stored in the Concert - TRIAD Series Software database and may be accessed using the Result Viewer (refer to Section 7.2, [Viewing Measurement Results in the Result Viewer](#)).

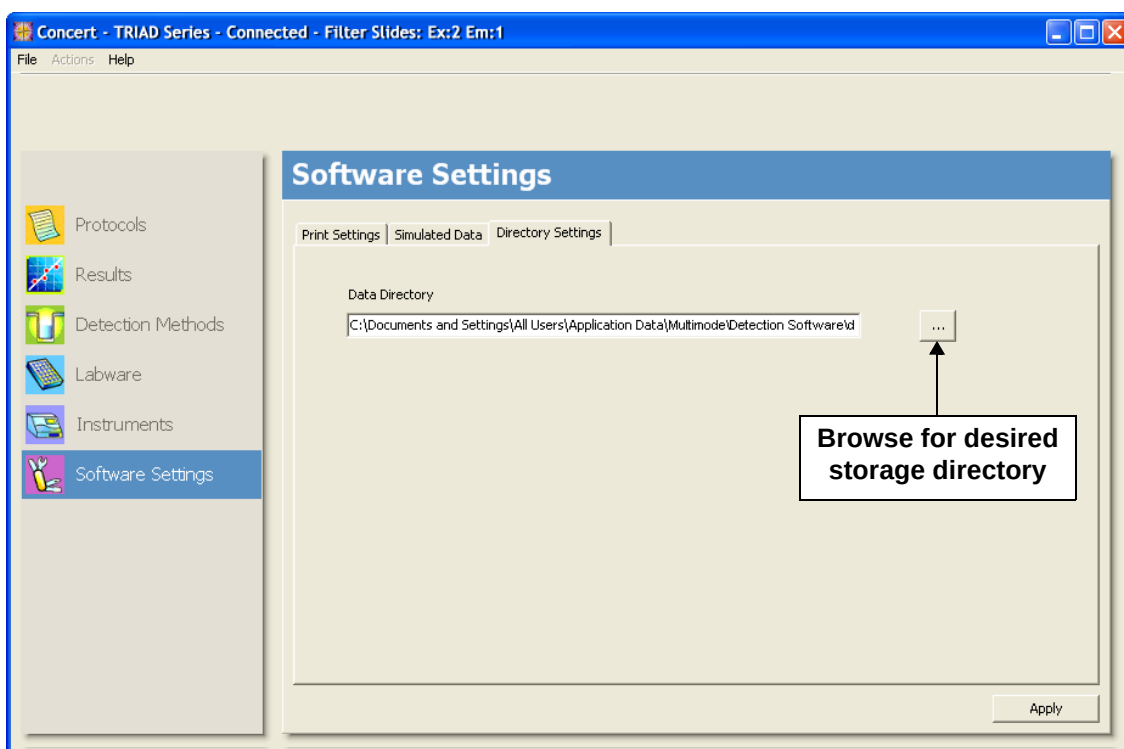


Figure 1-13. Choosing the directory where data is saved

To choose a different storage directory:

1. Choose the **Directory Settings** tab. Directory Settings appears (Figure 1-13).
2. In Data Directory, enter the complete path of the desired storage directory; for example, **C:\documents\multimode measurement results\MyResults**. Proceed to step 4.

OR

Choose **Browse for a directory**. Open appears.

3. In **Open**, browse to desired directory.
4. Choose **Open** to select the directory and return to **Output Settings**.
OR
Choose **Cancel** to close **Open** without selecting a new storage directory.
5. Choose **Apply** to set the new storage directory.

2 Setting Up and Controlling Instruments

2.1 Overview

Before defining measurement protocols, detection methods, and labware, or running protocols on an instrument using Concert - TRIAD Series Software, the instrument must be set up and configured. All configured instruments are listed in the Instrument Selection List.

The Instrument Selection List allows quick access to common instrument actions, such as loading and ejecting the plate carrier, and to configure instrument settings.

Use the Instrument Selection List for:

- [Controlling Instrument Actions](#) (Section 2.2).
- [Configuring Instrument Settings](#) (Section 2.3).

To configure and manually control instruments:

From the navigation pane, choose **Instruments**. The Instrument Selection List appears (Figure 2-1).

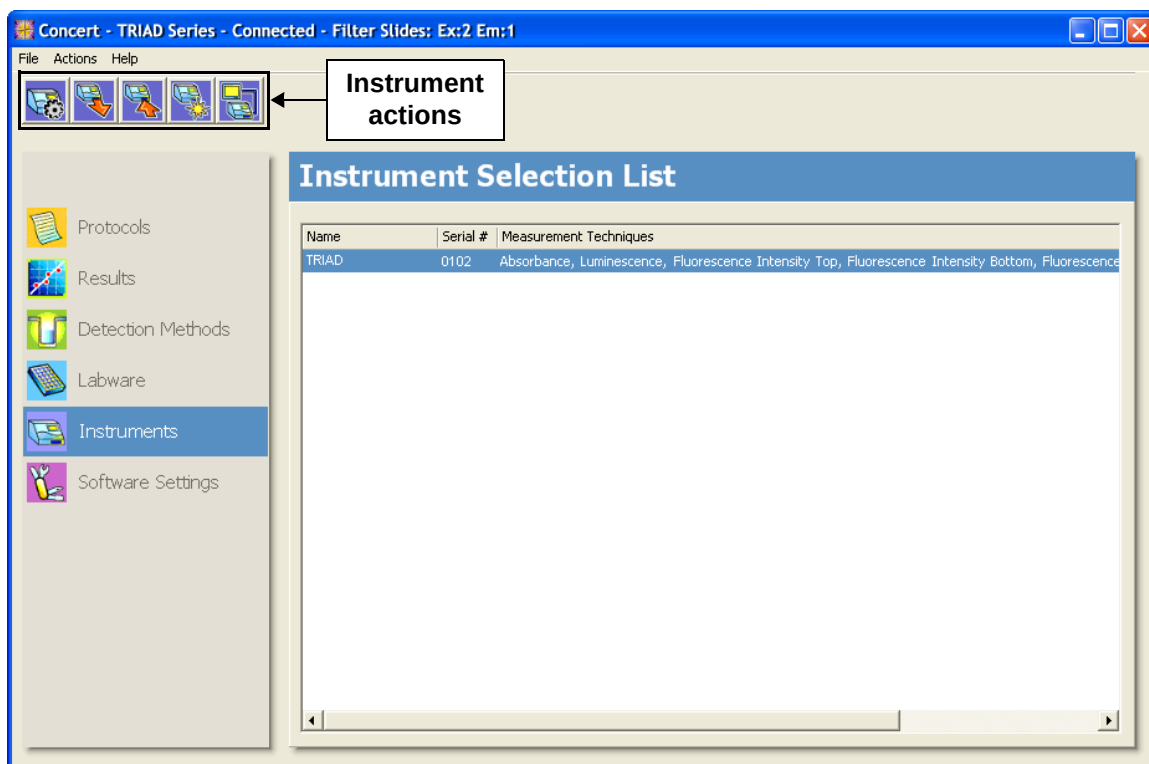


Figure 2-1. Instrument Selection List

All instruments that have been connected to the host computer and configured in the software are displayed in the Instrument Selection List. When an instrument not currently connected to the computer is selected, the software automatically enters simulation mode (refer to Section 2.2.5, [Enabling Simulation Mode](#)). This allows protocols, detection methods, and labware to be defined, edited, and tested for the selected instrument even though it is not physically connected to the host computer.

2.2 Controlling Instrument Actions

Instrument actions, such as ejecting or loading the plate carrier and initializing the instrument, can be performed directly from the Instrument Selection List using the buttons on the toolbar.

Actions that may be controlled include:

- [Ejecting the Plate Carrier](#) (Section 2.2.1).
- [Loading the Plate Carrier](#) (Section 2.2.2).
- [Initializing the Instrument](#) (Section 2.2.3).
- [Connecting to the Instrument](#) (Section 2.2.4).
- [Enabling Simulation Mode](#) (Section 2.2.5).

2.2.1 Ejecting the Plate Carrier

Eject the plate carrier moves the plate carrier outside the instrument to allow access for placement or removal of a microplate.

To eject the plate carrier:

1. In the Instrument Selection List, select the desired instrument (Figure 2-1).
2. From the toolbar, choose **Eject the plate carrier**.



OR

From the Actions menu, choose **Eject the plate carrier**.

OR

Right-click on the desired instrument and choose **Eject the plate carrier** from the menu that appears.

2.2.2 Loading the Plate Carrier

Load the plate carrier retracts the plate carrier and microplate back inside the instrument in preparation of performing a measurement.

To load the plate carrier:

1. In the Instrument Selection List, select the desired instrument (Figure 2-1).
2. From the toolbar, choose **Load the plate carrier**.



OR

From the Actions menu, choose **Load the plate carrier**.

OR

Right-click on the desired instrument and choose **Load the plate carrier** from the menu that appears.

2.2.3 Initializing the Instrument

Initializing the instrument moves the optics and microplate transports to home positions. The instrument is initialized automatically each time it turned on. If necessary, the instrument may be initialized manually; for example, after an emergency stop has been performed (refer to the *TRIAD Series Multimode Detector User's Manual*, Section 1.3.1.1, [Performing an Emergency Stop](#)).

Note: When a hardware error occurs, turning the instrument off and on is the recommended initialization method.

To manually initialize the instrument:

1. In the Instrument Selection List, select the desired instrument (Figure 2-1).
2. From the toolbar, choose **Initialize the instrument**.



OR

From the Actions menu, choose **Initialize the instrument**.

OR

Right-click on the desired instrument and choose **Initialize the instrument** from the menu that appears.

2.2.4 Connecting to the Instrument

When started, Concert - TRIAD Series Software automatically establishes communication with the instrument or enters simulation mode when no instrument is detected. The connection to the instrument may be established manually after physically connecting a different instrument to the computer, or when switching from simulation mode (refer to Section 2.2.5, [Enabling Simulation Mode](#)).

To connect to the instrument:

1. In the Instrument Selection List, select the desired instrument (Figure 2-1).
2. From the toolbar, choose **Connect to the instrument**. The button remains depressed while the instrument is connected and not in simulation mode.



OR

From the Actions menu, choose **Connect to the instrument**.

OR

Right-click on the desired instrument and choose **Connect to the instrument** from the menu that appears.

2.2.5 Enabling Simulation Mode

Concert - TRIAD Series Software can operate in simulation mode whether or not an instrument is connected. Simulation mode enables all features supported by the instrument currently selected in the Instrument Selection List, but measurement results are generated randomly or read from a file. Refer to Section 1.4.2.2, [Choosing Simulated Data Files](#), for more information about selecting simulated data files.

To enable simulation mode:

1. In the Instrument Selection List, choose the desired instrument.
2. From the toolbar, choose **Simulate the current instrument**. The button remains depressed while the instrument is in simulation mode.



OR

From the Actions menu, choose **Simulate the current instrument**.

OR

Right-click on the desired instrument and choose **Simulate the current instrument** from the menu that appears.

2.3 Configuring Instrument Settings

Communication settings and filter slides used by the instrument are configured in Instrument Settings. Configuring Instrument Settings informs Concert - TRIAD Series Software about the instrument, such as the communication speed and port used, and the configuration of filter slides and individual filters. Instrument features, such as microplate shaking, may also be controlled manually.

Note: When Signet is enabled on the system, only users assigned a role containing the Instrument Settings permission may configure instrument settings. Refer to Section 3.3.1.1, [Configuring Roles for Concert - TRIAD Series Software User Accounts](#), for more information about roles and permissions.

To configure instrument settings:

1. Select the desired instrument in Instrument Selection List.
2. From the toolbar, choose **Instrument Settings**. Instrument Settings appears.



OR

From the ACTIONS menu, choose **Instrument Settings**.

OR

Right-click on the desired instrument and choose **Instrument Settings** from the menu that appears.

3. Configure instrument settings on the three tabs as described in the following sections:
 - [Configuring Basic Instrument Settings](#) (Section 2.3.1).
 - [Defining and Editing Filter Slides](#) (Section 2.3.2).
 - [Manually Controlling the Instrument](#) (Section 2.3.3).

2.3.1 Configuring Basic Instrument Settings

The Basic Settings tab (Figure 2-2) contains information about the connection from the instrument to the operating computer, as well as identifying information about the instrument. The Port and Baudrate must be configured correctly to enable Concert - TRIAD Series Software to communicate with the instrument.

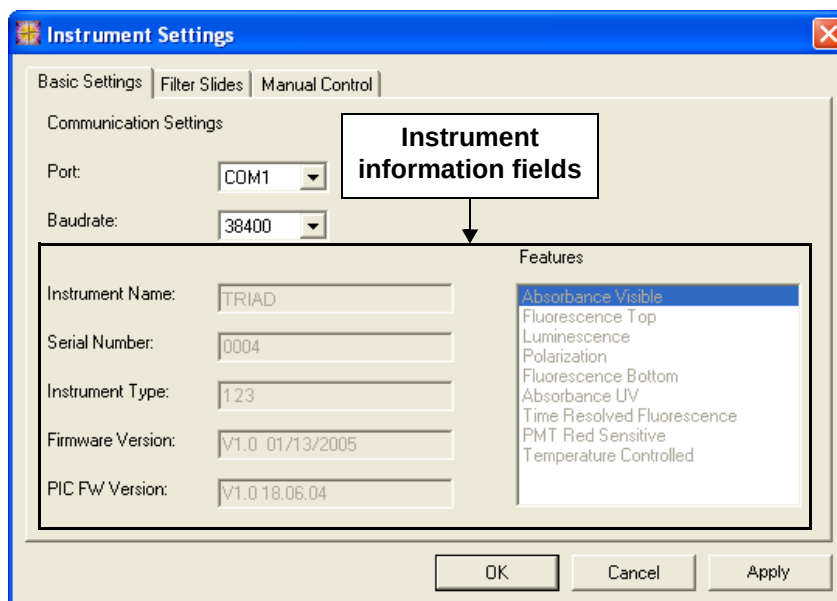


Figure 2-2. Instrument Settings — Basic Settings

To configure basic instrument settings:

1. In Instrument Settings, choose the **Basic Settings** tab, if necessary.
2. In Port, select the serial communications port on the host computer that connects to the instrument.
3. In Baudrate, select **38400**.
4. Choose **Apply** to detect the instrument. When the instrument is detected, the instrument information fields are autopopulated with information about the connected instrument. Refer to Table 2-1 for more information about each field.

Table 2-1. Basic Settings Read-Only Fields

Field	Description
Instrument Name	The model of the instrument.
Serial Number	The serial number of the instrument.
Instrument Type	A numerical code used by the software to identify the instrument type.
Firmware Version	The version of firmware loaded for the instrument.
PIC FW Version	The version of firmware loaded for the instrument PIC processor.
Features	The types of measurements the instrument is capable of performing.

2.3.2 Defining and Editing Filter Slides

The Filter Slides tab (Figure 2-3) is used to add, remove, and configure filter slides and the filters installed on a filter slide. Slide definitions may also be imported and exported as desired.

Filters used to perform measurements are mounted on two types of interchangeable slides. One slide is reserved for excitation filters used in absorbance and fluorescence measurements; the other is used for emission filters used in fluorescence and some luminescence measurements. Excitation and emission filter slides are different sizes to prevent them from being installed in the incorrect position. Each slide can hold up to six filters.

When exchanging slides, an identification code built into the slide allows Concert - TRIAD Series Software to recognize the new slide and filter configuration. When a slide with a new configuration is inserted, or the filters on a slide change, the slide must be configured in the Filter Slides tab. Up to 31 excitation filter slides and 31 emission filter slides may be stored in Concert - TRIAD Series Software at one time.

This section covers:

- [Adding Filter Slides](#) (Section 2.3.2.1).
- [Configuring Filter Slides](#) (Section 2.3.2.2).
- [Removing Filter Slides](#) (Section 2.3.2.3).
- [Exporting and Importing All Filter Slide Configurations](#) (Section 2.3.2.4).
- [Exporting and Importing Individual Filter Slide Configurations](#) (Section 2.3.2.5).

Note: Refer to the *TRIAD Series Multimode Detector User's Manual*, Section 1.3.2, [Exchanging Filter Slides](#), for information on physically installing filters and filter slides.

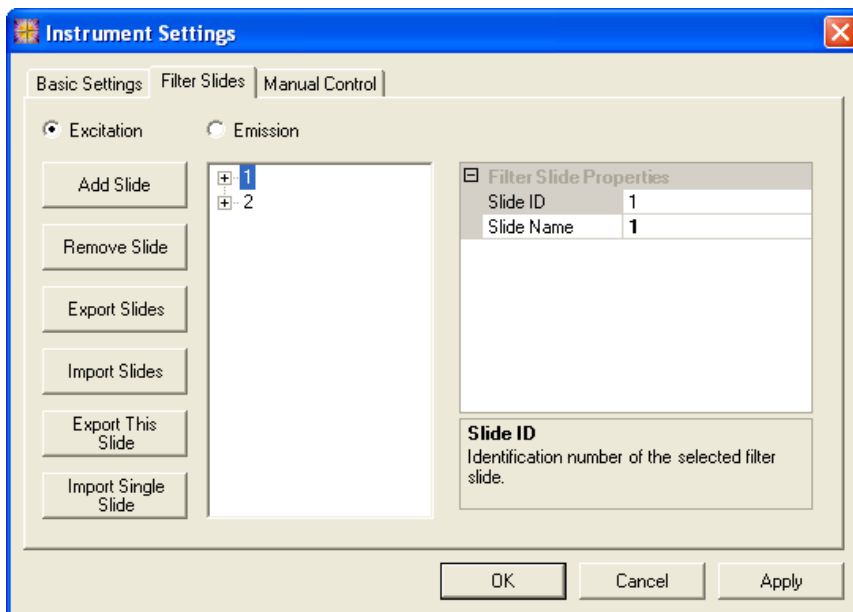


Figure 2-3. Instrument Settings — Filter Slides

2.3.2.1 Adding Filter Slides

When a new filter slide is used with the instrument for the first time, it must be added so Concert - TRIAD Series Software can identify the slide and filter configuration.

To add filter slides:

1. Select the type of filter slide to add: **Excitation** or **Emission**. The list of filter slides displays all slides of the selected type currently stored in memory.
2. Choose **Add Slide**. A new filter slide is added to the list of filter slides.
3. Configure the slide following the steps in Section 2.3.2.2, [Configuring Filter Slides](#).

2.3.2.2 Configuring Filter Slides

The filter slide configuration includes a name and ID for the slide and information about the filters installed on the slide. When a new slide is added, or the filter configuration on a slide changes, the slide must be configured.

To configure a filter slide:

1. Select the type of filter slide to configure: **Excitation** or **Emission**. The list of filter slides displays all configured slides of the selected type.
2. Select the desired filter slide to configure from the list. Filter Slide Properties displays information about the selected slide (Figure 2-3).
3. In Slide ID, enter the identification number printed on the slide.
4. In Slide Name, enter a name to identify the filter slide.
5. In the list of filter slides, click the **+** to the left of the filter slide name to display the list of filters installed on the slide.
6. Select a filter to configure. Filter Properties for the selected filter is displayed on the right side of the screen (Figure 2-4).

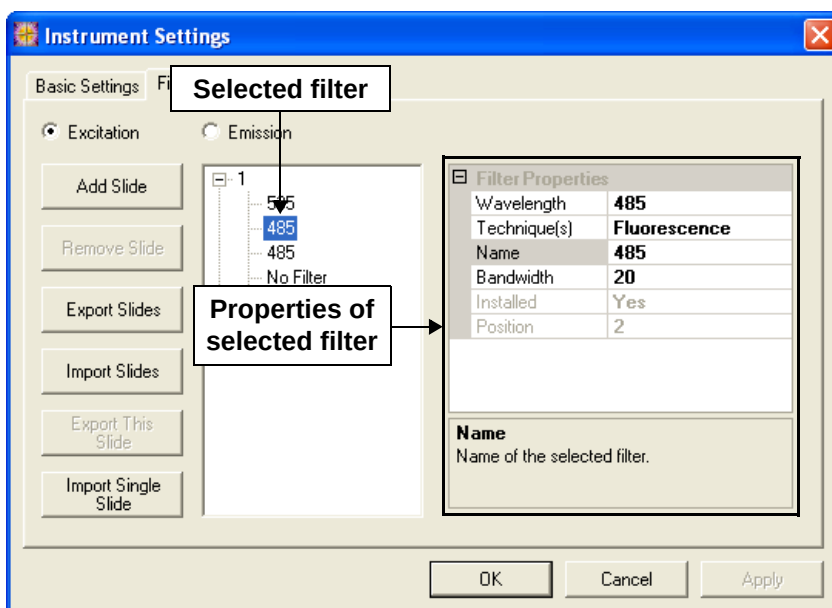


Figure 2-4. Configuring filter properties

7. In **Wavelength**, enter the wavelength of the filter.
8. Click in the **Technique(s)** field and then click the down arrow to display a list of the available detection techniques.
9. Select all techniques for which the filter applies. The filter can be used only for measurements of the selected technique type(s). When techniques are selected, the read-only **Installed** field displays **Yes**. When **No** is displayed, no techniques are selected and the filter may not be used in any techniques.
 - **TRIAD** — Select **Polarization** only for filter positions where a polarization filter is installed.
10. In **Name**, enter a name for the selected filter. Filter names default to the wavelength entered, but may be renamed as desired.
11. In **Bandwidth**, enter the bandwidth in nanometers of the selected filter.
12. Repeat steps 6 to 11 to configure additional filters on the slide.

2.3.2.3 Removing Filter Slides

If a filter slide is no longer used with an instrument, it can be removed from Concert - TRIAD Series Software.

To remove a filter slide:

1. Select the type of filter slide to remove: **Excitation** or **Emission**. The list of filter slides displays all slides of the selected type.
2. Select the desired filter slide to remove from the list. **Filter Slide Properties** displays information about the selected slide.
3. Choose **Remove Slide**. The selected filter slide is removed from the list.

2.3.2.4 Exporting and Importing All Filter Slide Configurations

Information for all excitation and emission filter slides configured for the instrument can be exported to an XML file and imported at a later time to restore that configuration or share the filter slide configuration with another instrument. Importing the filter slide configuration from an XML file replaces the current configuration for *all* filter slides with the configuration from the file.

Note: If necessary, the default filter slide configuration may be restored by importing the file for the type of instrument in use located in Documents and Settings\All Users\Application Data\Multimode\Detection Software\Filters.

To export all filter slides:

1. Choose **Export Slides**. Save As appears.
2. In **Save As**, select the desired directory and enter a file name.
3. Choose **Save**. Slide information is saved as an .xml file with the specified path and file name.

To import all filter slides from a previously exported file:

1. Choose **Import Slides**. Open appears.
2. In **Open**, browse to and select the desired .xml file to import.
3. Choose **Open**. The filter slides defined in the .xml file are imported into the filter slide list and replace all existing filter slides.

2.3.2.5 Exporting and Importing Individual Filter Slide Configurations

Configuration information for a single filter slide may be exported to an XML file and imported to restore that configuration or share the configuration with another instrument.

To export a filter slide configuration:

1. In the list of filter slides, choose the slide desired to export.
2. Choose **Export This Slide**. Save As appears.
3. In **Save As**, select the desired directory and enter a file name.
4. Choose **Save**. Slide information is saved as an .xml file with the specified path and file name.

To import a filter slide configuration:

1. If the list of filter slides contains a slide with the same ID as the slide configuration desired to import, delete that slide. Every filter slide ID stored in the software must be unique.
2. Choose **Import Single Slide**. Open appears.
3. In **Open**, browse to and select the desired .xml file to import.
4. Choose **Open**.

2.3.3 Manually Controlling the Instrument

The Manual Control tab (Figure 2-5) provides options to control the actions of the connected instrument, such as shaking microplates and ejecting or loading filter slides.

Manual Control is divided into five subsections:

- [Temperature Control \(TRIAD only\)](#) (Section 2.3.3.1).
- [Shake Control](#) (Section 2.3.3.2).
- [Plate Control](#) (Section 2.3.3.3).
- [Excitation and Emission Filter Slide Control](#) (Section 2.3.3.4).

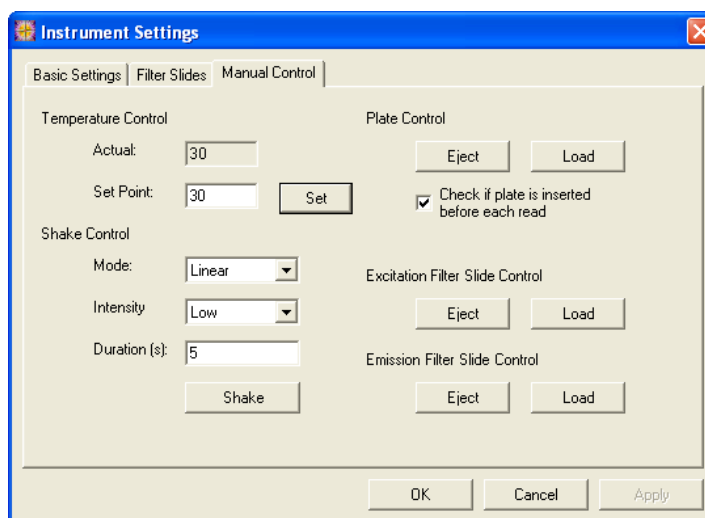


Figure 2-5. Instrument Settings — Manual Control

2.3.3.1 Temperature Control (TRIAD only)

Temperature Control is used to set the microplate chamber temperature. The temperature is set by heating the microplate chamber; cooling the chamber is not supported. Depending on the light source used to perform measurements configured in the protocol, the temperature may range from 3°C (5.4°F) or 4°C (7.2°F) above ambient to 45°C (113°F). Actual displays the current temperature of the instrument.

To set the temperature:

1. In Set Point, enter the desired temperature in Celsius.
2. Choose **Set**. Temperature control is activated for the instrument and begins to heat to the desired temperature. The set temperature is maintained until it is changed or the instrument is powered off.

Note: A minimum of 30 minutes is required for the instrument to reach the desired temperature. The actual time required depends on the relative change in temperature.

To turn off temperature control:

In Set Point, enter **0**, then choose **Set**.

OR

Turn power to the instrument off and on.

2.3.3.2 Shake Control

Shake Control is used to manually shake the microplate loaded in the instrument.

To manually perform a shaking operation:

1. In Mode, select the desired shaking mode:
 - **Linear** — shakes from side to side.
 - **Orbital** — shakes in a circular pattern.
 - **Squared** — shakes in a square pattern, moving at right angles.



CAUTION: Shake low density plates, such as 6- or 48-well plates, at low speed only. Shaking low density plates at higher speeds may cause liquid in wells to spill.

2. In Intensity, select the desired shaking intensity: **Low**, **Medium**, or **High**.
3. In Duration, enter the length of time to shake in seconds.
4. Choose **Shake**. The instrument shakes the microplate according to the configured settings.

2.3.3.3 Plate Control

Plate Control provides options to eject or load the plate carrier. It also features an option to sense that a microplate is in the plate carrier before starting a measurement.

To manually control the plate carrier:

- Choose **Eject** to extend the plate carrier outside the instrument.
- Choose **Load** to retract the plate carrier inside the instrument.
- Select **Check if plate is inserted before each read** to sense if a microplate is in the plate carrier before starting each measurement.

2.3.3.4 Excitation and Emission Filter Slide Control

Excitation Filter Slide Control and Emission Filter Slide Control are used to manually eject or load the excitation or emission filter slides.

To manually eject or load the excitation or emission filter slide:

- Choose **Eject** from the desired filter slide control section to unload the filter slide from the filter compartment and partially open the compartment door.

Note: To remove the filter slide, it is still necessary to grasp it by the tab and pull it until it is free of the geared track. Store the removed filter slide in a protected, dust-free area, preferably in the original packaging.

- Choose **Load** from the desired filter slide control section to retract the filter slide into position.

3 Setting Up and Using Signet

3.1 Overview

To assist users in complying with electronic signature regulations, such as 21 CFR Part 11, the optional Concert - TRIAD Series Analysis Software with Signet module may be purchased separately. When Signet is enabled for Concert - TRIAD Series Software, users must have a valid user account and password on the system to access the software. Each user is assigned roles that contain specific permissions which determine the software actions the user may perform.

Signet provides support for closed systems only; access over a network is not supported. In a location where several systems are present, Signet must be installed and enabled separately for each system where compliance is desired. Users require separate accounts on each system they need to access.

Note: Compliance with regulations, such as 21 CFR Part 11, requires implementing site processes beyond the control of the software.

A single system administrator sets up the level of support provided by Signet, creates and manages roles assigned to user accounts, and configures Signet system parameters.

This chapter covers:

- [Setting Up Signet](#) (Section 3.2).
- [Performing System Administration Tasks](#) (Section 3.3).
- [Performing Signet User Actions in Concert - TRIAD Series Software](#) (Section 3.4).

3.2 Setting Up Signet

Signet allows a single system administrator account to exist on a system. The administrator is responsible for setting up the system and performing ongoing system administration tasks, such as configuring user accounts. Setting up Signet includes:

- [Changing the Administrator Password](#) (Section 3.2.1).
- [Setting the Signet Support Level](#) (Section 3.2.2).

3.2.1 Changing the Administrator Password

The administrator password should be changed from the default password provided with the module before enabling Signet or performing other system administration tasks. The administrator password is changed in the Account Management application.

To access Account Management and change the administrator password:

1. Install the Concert - TRIAD Series Analysis Software with Signet module, if necessary (refer to Section 1.3.4, [Installing Optional Modules](#)).
2. When the module installation is complete, from the Start menu, choose **Settings>Control Panel**. Control Panel appears.
3. In Control Panel, choose **Administrative Tools**.
4. In Administrative Tools, choose **Account Management**. Administrator Login appears.
5. In Administrator Login, enter **password**, the default administrator password. Account Management appears (Figure 3-1).

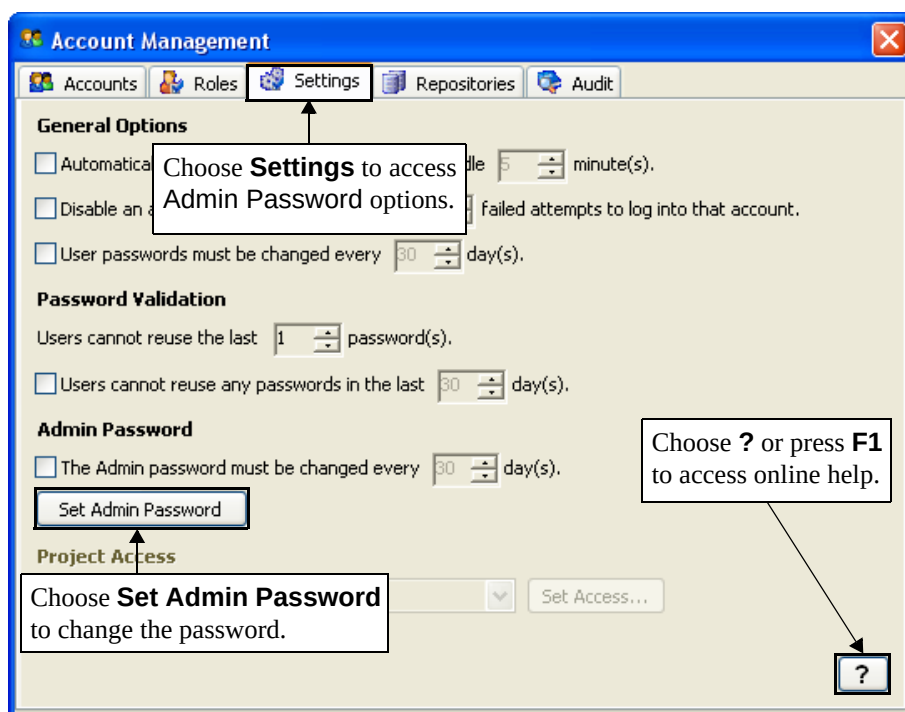


Figure 3-1. Account Management

6. In Account Management, choose the **Settings** tab.
7. In Settings, choose **Set Admin Password** and enter a new administrator password. Refer to the Account Management online help for more information.

Note: Account Management online help may be accessed by pressing **F1** or choosing the help button in the lower right corner of the window (Figure 3-1).

8. Close Account Management.
9. Follow the steps in Section 3.2.2, [Setting the Signet Support Level](#) to set the level of support provided by Signet.

3.2.2 Setting the Signet Support Level

Signet provides three support levels:

- **No Support** — Signet is disabled; user accounts are not required.
- **Signet** — User accounts are required to log into the software, but passwords are not required to sign items.

Note: Signet without password checks may not provide adequate support to comply with 21 CFR Part 11 or other regulations. Each site must evaluate the level of support required for a given system.

- **Signet, with password checks for signing and check-in** — User accounts are required to log into the software, and passwords must be entered for confirmation when prompted.

Note: Compliance with regulations, such as 21 CFR Part 11, requires implementing site processes beyond the control of the software.

To set the level of support:

1. Log off and close all software applications using Signet.
2. Place the Signet CD in the drive, and browse to the contents of the CD.
3. Double-click **Signet - Support Options.exe**.
4. When prompted, enter the **Administration Password** and choose **OK**. Support Options appears (Figure 3-2).

Note: If the Administration Password is lost, forgotten, or not known, follow the steps in Section 3.3.2, [Restoring the Administrator Password](#).

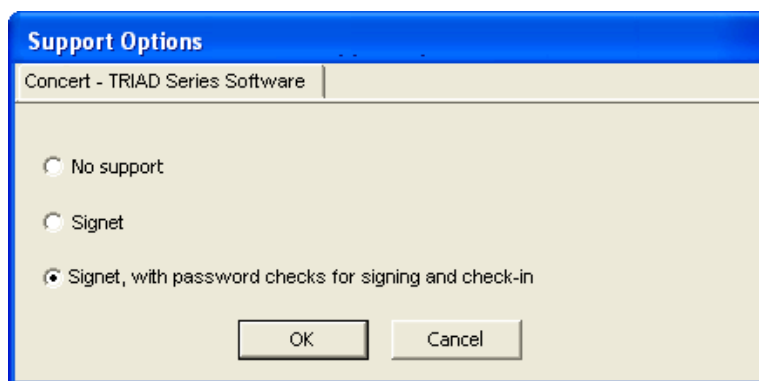


Figure 3-2. Support Options

5. Choose the **Concert - TRIAD Series Software** tab, if necessary. Multiple tabs appear only when several software applications with Signet support are installed on the system.
6. Select the level of support:
 - **No support** — User accounts are not required to access Concert - TRIAD Series Software. Users have access to all software operations and functionality. System activity is logged in the audit trail and may be viewed in the Audit Log (refer to Section 3.3.3, [Viewing the System Activity Audit Log](#)).
 - **Signet** — Enables the use of user accounts and permissions for Concert - TRIAD Series Software. Users must log in to use the software and may access only features and actions for which they have permission. Actions performed in the software, such as signing a labware type or protocol, do not require password confirmation.

Note: Signet without password checks may not provide adequate support to comply with 21 CFR Part 11 or other regulations. Each site must evaluate the level of support required for a given system.

- **Signet, with password checks for signing and check-in** — Enables the use of user accounts and permissions and electronic signatures for Concert - TRIAD Series Software. Users must log in to use the software and may access only features and operations for which they have permission. Support for 21 CFR Part 11 or other regulations is provided by requiring password checks for operations such as signing a detection method.

Note: When other applications that support Signet are installed on the system, each must be configured with the same support level as Concert - TRIAD Series Software.

Note: Regulations, such as 21 CFR Part 11, contain additional requirements for account management beyond the control of this software.

7. Choose **OK** to activate the support level chosen and close Support Options.
OR
Choose **Cancel** to close Support Options without changing the support level.

3.3 Performing System Administration Tasks

On a system with Signet enabled, a single administrator account provides the ability to perform Signet system administration tasks, including:

- [Administering User Accounts and Roles](#) (Section 3.3.1).
- [Restoring the Administrator Password](#) (Section 3.3.2).
- [Viewing the System Activity Audit Log](#) (Section 3.3.3).

3.3.1 Administering User Accounts and Roles

Signet system administration tasks are performed in the Account Management application included as part of the Signet installation. The system administrator sets up and configures user accounts, passwords, and roles, and configures system settings, such as automatic password expiration and system logout time.

A single system administrator password is used on a system. System administration tasks may be performed only on the computer where Account Management is installed; access to Account Management over a network is not supported.

Note: If the administrator requires access to Concert - TRIAD Series Software, a separate user account must be created.

Note: Regulations, such as 21 CFR Part 11, contain additional requirements for account management beyond the control of this software.

This section covers accessing Account Management and configuring roles that are assigned to user accounts (refer to Section 3.3.1.1, [Configuring Roles for Concert - TRIAD Series Software User Accounts](#)). Refer to the Account Management online help for detailed information about Signet system administration tasks.

To open Account Management:

1. Log off and close all software applications using Signet.
2. In the Windows® Start menu, choose **Settings>Control Panel**. Control Panel appears.
3. In Control Panel, double-click **Administrative Tools**. Administrative Tools appears.
4. In Administrative Tools, double-click **Account Management**. Administrator Login appears.

5. In Administrator Login, enter the administrator password and choose **OK**. Account Management appears (Figure 3-3).

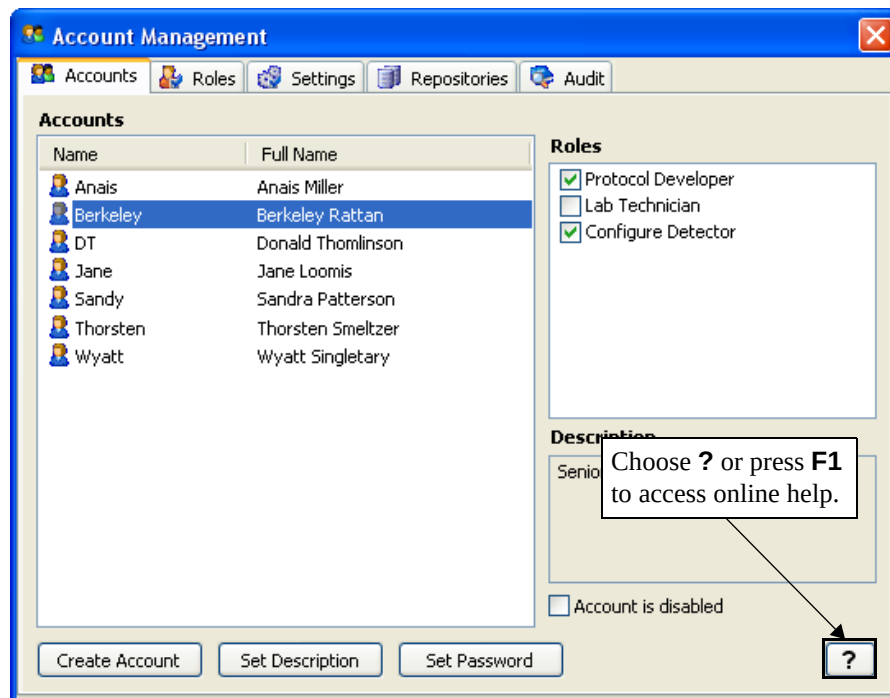


Figure 3-3. Account Management

3.3.1.1 Configuring Roles for Concert - TRIAD Series Software User Accounts

Concert - TRIAD Series Software permissions, which control access to software actions, are installed with the Concert - TRIAD Series Analysis Software with Signet module. Permissions are not assigned directly to user accounts; instead the system administrator assigns permissions to roles, which are then assigned to accounts as desired.

Roles may be assigned multiple permissions. When several software applications that support Signet are installed on the same system, permissions from different applications may be assigned to the same role. A permission may be assigned to as many roles as desired.

Three preconfigured roles are installed with the module (refer to Table 3-2). These roles may be assigned to user accounts as is, or edited, renamed, or deleted as desired.

Note: Refer to the Account Management online help for more detailed information. To access online help, press **F1** or choose the help button in the lower right corner of the window.

To configure roles:

1. In Account Management, choose the **Roles** tab (Figure 3-4).

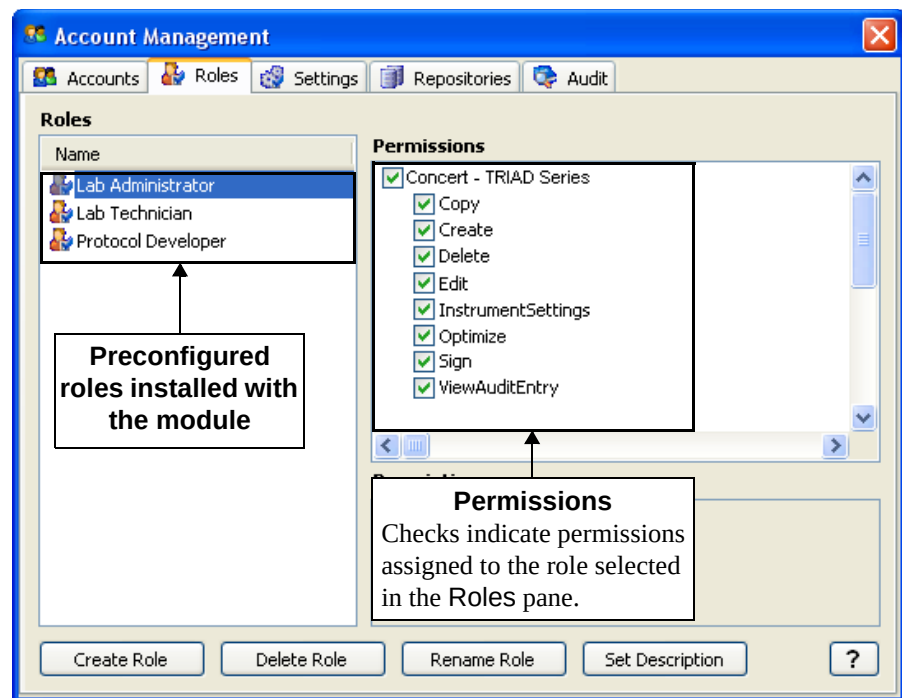


Figure 3-4. Configuring roles

2. In Roles, create a new or select an existing role to edit. Table 3-2 describes the default roles provided with the software.
3. In Permissions, select the permissions to include in the selected role. Table 3-1 describes the permissions available for Concert - TRIAD Series Software.
4. Repeat steps 2 and 3 for each role being configured.
5. When all roles are configured as desired, choose the **Accounts** tab.

6. In **Accounts**, choose a user account and select the desired role(s) to assign to the account.

Table 3-1. Concert - TRIAD Series Software Permissions

Permission	Description
Copy	Allows users to make copies of protocols, labware types, and detection methods.
Create	Allows users to create protocols, labware types, and detection methods.
Delete	Allows users to delete protocols, labware types, and detection methods.
Edit	Allows users to edit protocols, labware types, and detection methods.
Instrument Settings	Allows users to configure instrument settings (refer to Chapter 2, Setting Up and Controlling Instruments).
Optimize	Allows users to optimize labware to account for slight dimensional variations that occur between production lots (refer to Section 5.6, Optimizing Labware).
Sign	Allows users to add, view, and unlock electronic signatures (refer to Section 3.4.5, Adding Electronic Signatures and Comments to Items).
View Audit Entry	Allows users to view the Concert - TRIAD Series Software audit log in the Audit Viewer (refer to Section 3.4.3, Viewing and Searching the Concert - TRIAD Series Software Audit Log).

Table 3-2. Concert - TRIAD Series Software Default Roles

Role	Description
Lab Administrator	Contains all Concert - TRIAD Series Software permissions. Users assigned this role may perform all software actions.
Protocol Developer	Contains the Concert - TRIAD Series Software Copy , Create , and Edit permissions. Users assigned this role may create and edit protocols, labware, and detection methods, but may not sign or delete items.
Lab Technician	No Concert - TRIAD Series Software permissions are assigned. Users assigned this role may run protocols and view measurement results, but not create, edit, delete, or sign items or change instrument settings.

3.3.2 Restoring the Administrator Password

Only one administrator account exists on a system with Signet installed. If the administrator password is lost or forgotten, DYNEX Technologies Customer Technical Support must be contacted to restore access to the Account Management application.

To restore the administrator password:

1. Place the Signet CD in the drive, and browse to the contents of the CD.
2. Double-click **Administrator Password Restore.exe**. Administrator Password Restore appears (Figure 3-5).

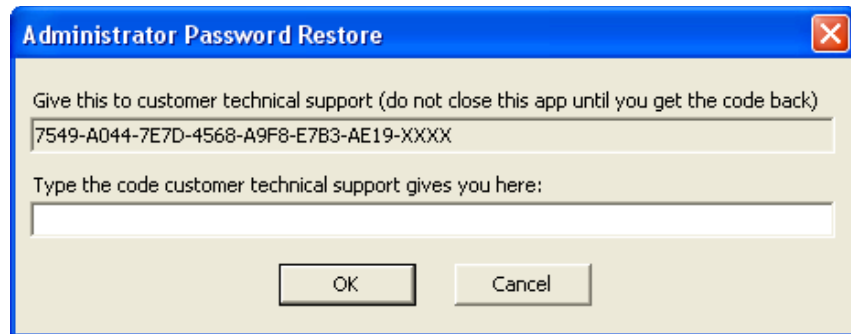


Figure 3-5. Password Restore

3. Contact technical support and provide the code displayed in the upper field of Administrator Password Restore.

Note: Leave Administrator Password Restore open until technical support supplies a new code. The new code is based on the code displayed in the upper field, which changes each time Administrator Password Restore is opened.

4. In the lower field of Administrator Password Restore, enter the new code provided by technical support.
5. Choose **OK** to close Administrator Password Restore and accept the new code.
6. Follow any additional instructions provided by technical support.

3.3.3 Viewing the System Activity Audit Log

The system administrator may view the Audit Log, which displays the audit trail for all user activity in software applications that support Signet. System activity is logged, even when Signet is set to No Support (refer to Section 3.2.2, [Setting the Signet Support Level](#)).

Note: Administrator activity, other than changing the level of support for Signet, is not saved in the Audit Log. Administrator activity is viewed in the Audit tab of the Account Management application.

User activity within Concert - TRIAD Series Software may be viewed in the Audit Viewer (refer to Section 3.4.3, [Viewing and Searching the Concert - TRIAD Series Software Audit Log](#)).

To view the Audit Log:

1. In the Windows® Start menu, choose **Settings>Control Panel**. Control Panel appears.
2. In Control Panel, double-click **Administrative Tools**. Administrative Tools appears.
3. In Administrative Tools, double-click **Audit Log**. The Audit Log appears (Figure 3-6).

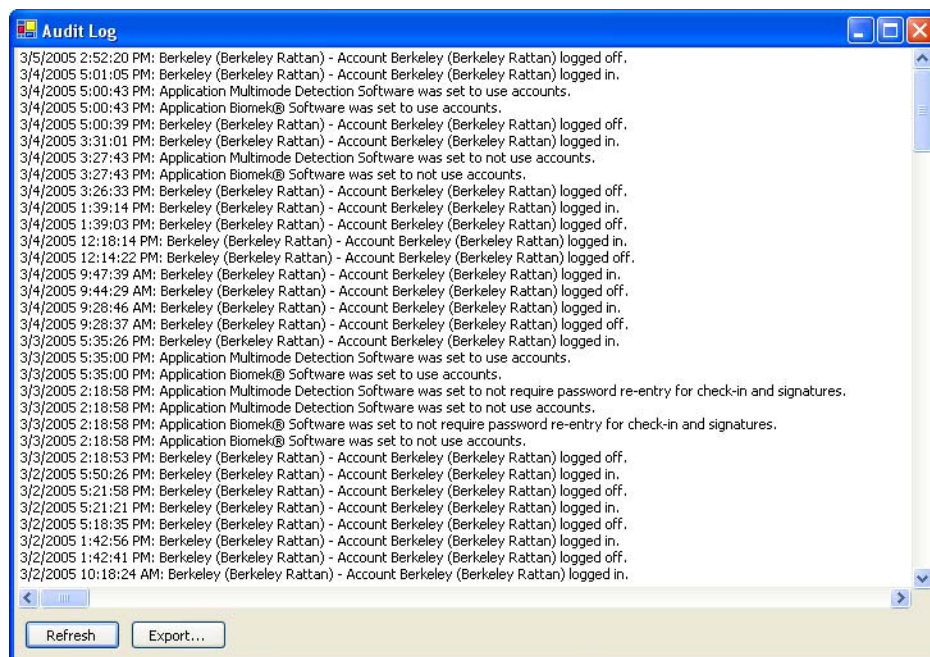


Figure 3-6. Signet Audit Log

4. Choose **Export** to export the entire audit log to a text file, if desired. The exported file may be opened, read, and printed in any application that supports text files.

Note: When the Audit Log is open while applications that support Signet are open, system activity is logged, but not refreshed onscreen automatically. Choose **Refresh** to view system activity logged since the Audit Log was opened or since the last time displayed data was refreshed.

3.4 Performing Signet User Actions in Concert - TRIAD Series Software

When Signet is enabled, users are required to log in to Concert - TRIAD Series Software. Permissions configured in the roles assigned to accounts determines which actions in the software are available to users. The User Selection List provides access to Signet actions (Figure 3-7).

Signet user actions include:

- [Logging On and Off the System](#) (Section 3.4.1).
- [Changing the Password of the User Currently Logged Into the System](#) (Section 3.4.2).
- [Viewing and Searching the Concert - TRIAD Series Software Audit Log](#) (Section 3.4.3).
- [Reactivating Disabled Message Boxes](#) (Section 3.4.4).
- [Adding Electronic Signatures and Comments to Items](#) (Section 3.4.5).

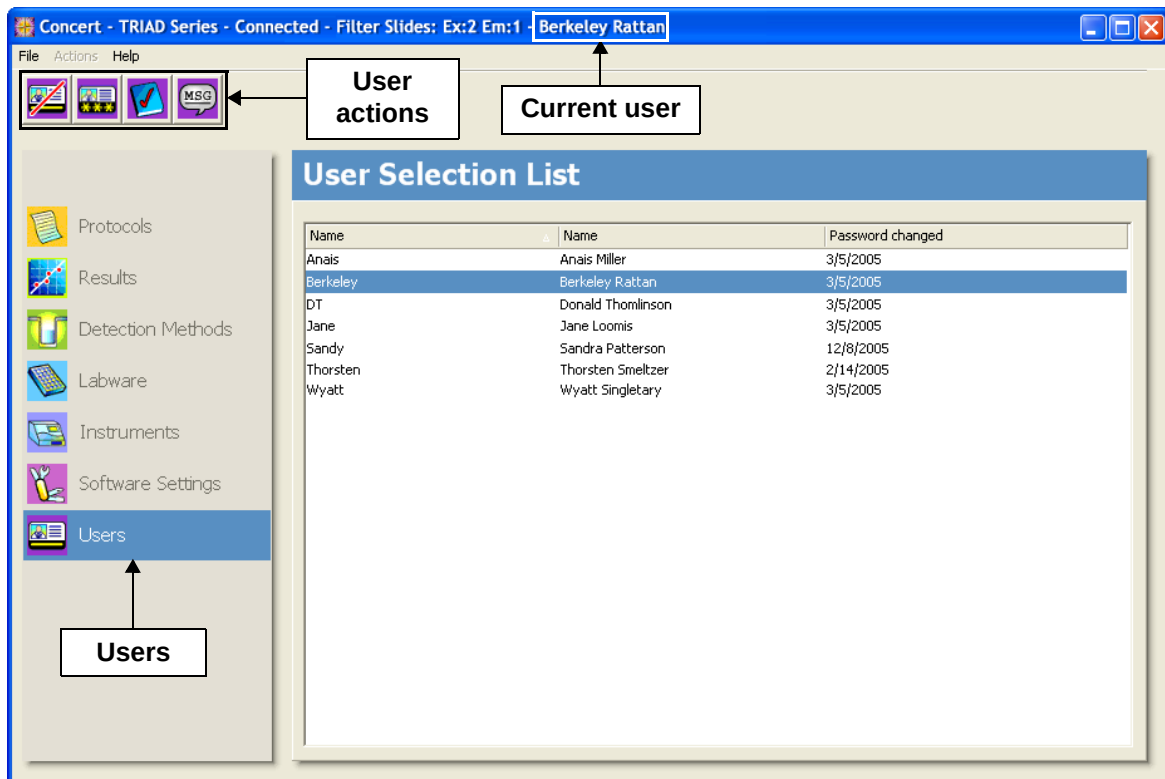


Figure 3-7. Accessing user actions

3.4.1 Logging On and Off the System

When Signet is enabled, users must log on before Concert - TRIAD Series Software or other installed applications that support Signet may be accessed. Only one user may be logged onto the system at time. Once logged in, the current user may access all applications installed on the system that support Signet.

This section covers:

- [Logging On the System](#) (Section 3.4.1.1).
- [Logging Off the System](#) (Section 3.4.1.2).
- [Handling Disabled Accounts](#) (Section 3.4.1.3).

3.4.1.1 Logging On the System

When the software launches or is idle with no user logged on, Logon appears (Figure 3-8).

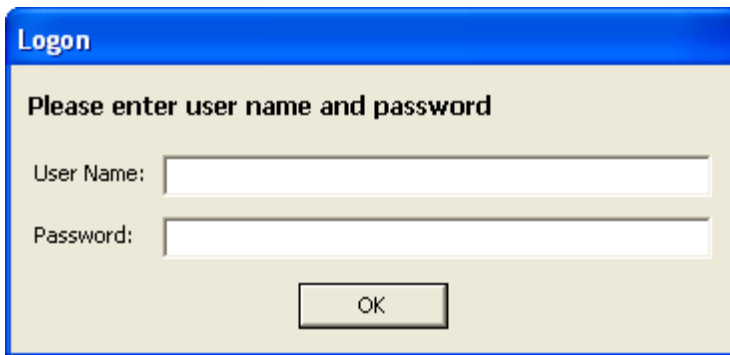


Figure 3-8. Logon

To log on the system:

1. Enter the desired account **User Name** and **Password**.

Note: The first time a user logs on using a new account, or after having the password changed by the administrator, Concert - TRIAD Series Software prompts for the password to be changed.

The new password must be different from the original and may include alphanumeric characters and spaces and be up to 250 characters in length. Passwords are not case sensitive.

2. Choose **OK**. The user is logged on to Concert - TRIAD Series Software and any other supported software applications installed on the system. The current user's full name appears in the title bar next to instrument status (Figure 3-7).

3.4.1.2 Logging Off the System

The current user must log off the system before another user may log on. Logging off automatically logs the user off all installed applications that support Signet.

To log off the system and close the software:

From the File menu, choose **Log out and exit**.

Note: Choosing Exit or closing Concert - TRIAD Series Software does not automatically log a user out of the system. The current user will remain logged on until the software is reopened and the account is logged off, or until the login times out automatically. Refer to the Account Management online help for more information about setting automatic logon time outs.

To log off the system and leave the software open for the next user:

1. In the navigation pane, choose **Users** to access the User Selection List, if necessary.
2. From the toolbar, choose **Log out current user**. The user is logged out of Concert - TRIAD Series Software and any other supported software applications installed on the system.



OR

From the Actions menu, choose **Log out current user**.

OR

Right-click in the User Selection List and choose **Log out current user** from the menu.

3.4.1.3 Handling Disabled Accounts

The administrator may manually disable user accounts in Account Management, or configure accounts to be automatically disabled after a number of logon attempts for the account fail.

When an account is automatically disabled, Administrator Notification appears (Figure 3-9). The administrator password must be entered before Concert - TRIAD Series Software may be accessed by users.

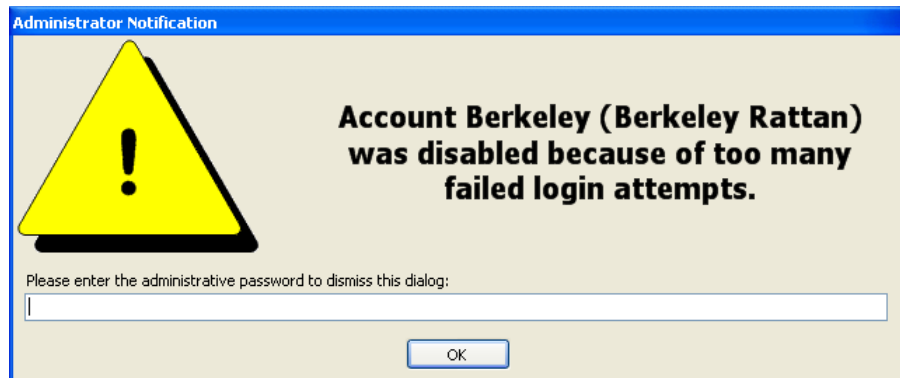


Figure 3-9. Administrator Notification

3.4.2 Changing the Password of the User Currently Logged Into the System

The user currently logged into the system may change their password.

To change the password:

1. In the navigation pane, choose **Users** to access the User Selection List, if necessary.
2. From the toolbar, choose **Change password of user currently logged in**. Change Password appears (Figure 3-10).



OR

From the Actions menu, choose **Change password of user currently logged in**.

OR

Right-click in the User Selection List and choose **Change password of user currently logged in** from the menu.

A dialog box titled "Change Password" with a blue header bar. The main area is light beige. It contains two text input fields. The first field is preceded by the text "Please enter the new password:" and contains a series of asterisks. The second field is preceded by the text "Please enter the new password again for confirmation:" and also contains a series of asterisks. At the bottom, there are two buttons: "OK" and "Cancel".

Figure 3-10. Changing the user password

3. In the upper field, enter the new password desired.
4. In the lower field, re-enter the new password to confirm.
5. Choose **OK** to change the password.

OR

Choose **Cancel** to close Change Password without changing the password.

3.4.3 Viewing and Searching the Concert - TRIAD Series Software Audit Log

Users assigned a role with the View Audit Entry permission may view or search the audit log of user activity within Concert - TRIAD Series Software. Refer to Table 3-1 for more information about the permissions available to users.

The Concert - TRIAD Series Software audit log lists actions performed within the software only. To view a log of systemwide Signet activity, use the system Audit Log (refer to Section 3.3.3, [Viewing the System Activity Audit Log](#)).

To view records in the log or search for specific records:

1. In the navigation pane, choose **Users** to access the User Selection List, if necessary.



2. From the toolbar, choose **View the audit log for this software**. Audit Viewer appears (Figure 3-11).

OR

From the Actions menu, choose **View the audit log for this software**.

OR

Right-click in the User Selection List and choose **View the audit log for this software** from the menu.

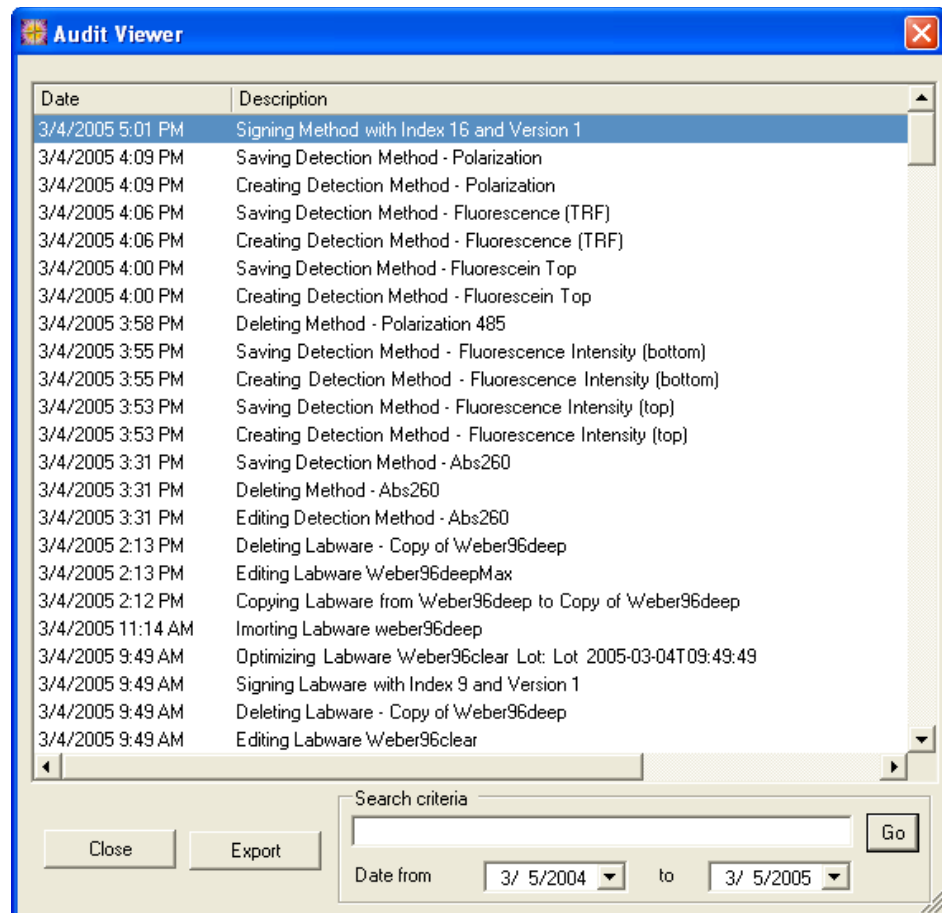


Figure 3-11. Viewing records in the Audit Viewer

3. In Audit Viewer, perform the action desired. Table 3-3 describes the actions available.

Table 3-3. Audit Log Actions

Action	Description
Close	Close the Audit Viewer
Export	Export records currently displayed in the Audit Viewer to an XML file.
Search Criteria	Enter the desired search term(s) and choose Go . All records containing matching terms are listed. Searching for term(s) within records may also be limited to specific dates configured in Date from...to .
Date from...to	Limit the records displayed to those falling between the specified dates. Searching for records by date may also be combined with term(s) entered in Search Criteria .

3.4.4 Reactivating Disabled Message Boxes

Message boxes that have been disabled by users may be reactivated.

Note: Message boxes are disabled by choosing **Don't show this message again** when the message box is displayed.

To reactivate disabled dialog boxes:

1. In the navigation pane, choose **Users** to access the User Selection List, if necessary.
2. From the toolbar, choose **Reactivate Disabled Message Boxes**. Message appears (Figure 3-12), confirming that the message boxes have been reactivated.



OR

From the Actions menu, choose **Reactivate Disabled Message Boxes**.

OR

Right-click in the User Selection List and choose **Reactivate Disabled Message Boxes** from the menu.



Figure 3-12. Activating disabled messages

3.4.5 Adding Electronic Signatures and Comments to Items

Protocols, measurement results, detection methods, and labware types may signed be by users assigned a role with the **Sign** permission. Signing an item adds a user's comments and electronic signature to the audit trail and prevents the item from being edited or deleted. An item may be signed multiple times by multiple users.

Users assigned a role with the **Sign** permission may also view existing signatures for signed items and unlock any signature attached to an item. An unlocked signature is deactivated and moved from **Signatures** to **History**; signatures are never permanently removed from the system. When all signatures for an item are unlocked, the item is no longer signed and may be edited again.

To sign an item or view or unlock an existing electronic signature:

1. From the desired Selection List, select the item to sign.
2. From the toolbar, choose **Sign the selected <item>**. Sign the Selected Item appears (Figure 3-13).

OR

From the Actions menu, choose **Sign the selected <item>**.

OR

Right-click on the selected item and choose **Sign the selected <item>** from the menu.

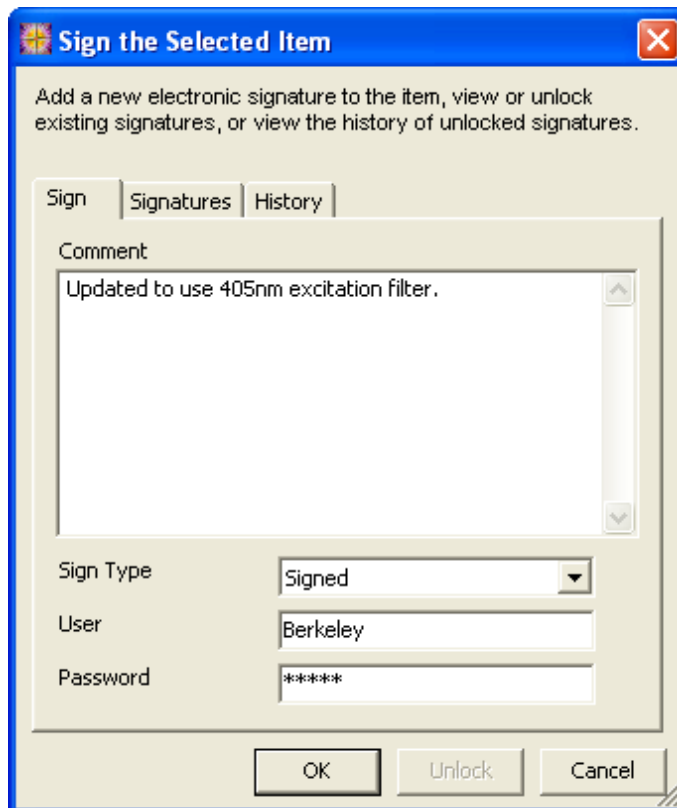


Figure 3-13. Signing an item

3. Choose the desired action:

- sign the item (refer to Section 3.4.5.1, [Signing Items](#)).
- view or unlock an existing signature (refer to Section 3.4.5.2, [Viewing or Unlocking Signatures for an Item](#)).
- view unlocked signatures (refer to Section 3.4.5.3, [Viewing Unlocked Signatures](#)).

3.4.5.1 Signing Items

To sign an item:

1. In the **Sign** tab (Figure 3-13), enter a **Comment**. A comment is required to complete an electronic signature.
2. Select the type of signature: **Sign** or **Approved**. The selected type is saved in the audit trail.
3. If the **Password** field is visible, enter the password for the user account.

Note: Passwords are required only when Signet, with password checks for signing and check-in is the selected support level (refer to Section 3.2.2, [Setting the Signet Support Level](#)).

4. Choose **OK** to sign the item.

OR

Choose **Cancel** to close Sign the Selected Item without signing the item.

3.4.5.2 Viewing or Unlocking Signatures for an Item

Users assigned a role with the Sign permission may view active signatures for an item in the Signatures tab. Users with the Sign permission may also unlock any signature attached to an item. An unlocked signature is deactivated and moved from Signatures to History; signatures are never permanently removed from the system (refer to Section 3.4.5.3, [Viewing Unlocked Signatures](#)). Unlocking *all* signatures attached to an item allows the item to be edited again.

To view existing signatures:

1. Choose the desired item and open Sign the Selected Item following the steps in Section 3.4.5, [Adding Electronic Signatures and Comments to Items](#).
2. Choose the Signatures tab (Figure 3-14).

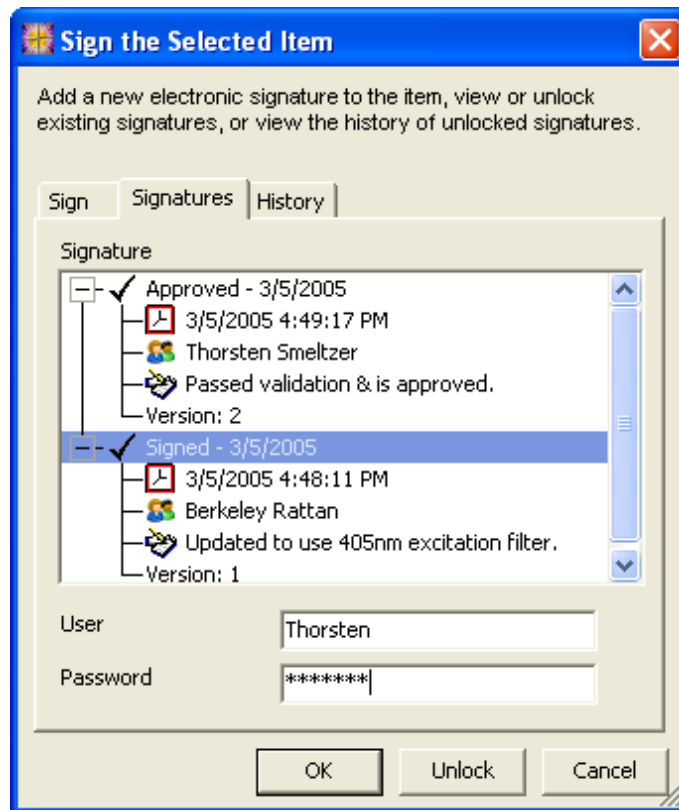


Figure 3-14. Viewing active signatures

3. Click on the + or - to the left of a signature to expand or collapse details about the signature. Details for each signature are listed on four lines:
 - date and time signature was entered
 - the full name of the user signing the item
 - user comments
 - version

4. If the Password field is visible, enter the password for the user account.

Note: Passwords are required only when Signet, with password checks for signing and check-in is the selected support level (refer to Section 3.2.2, [Setting the Signet Support Level](#)).

5. To unlock the selected signature, choose **Unlock**. Unlocked signatures may be viewed in the History tab.

3.4.5.3 Viewing Unlocked Signatures

Unlocked signatures are never permanently removed from the system. Users assigned a role with Sign permission may view unlocked signatures for an item in the History tab (Figure 3-15).

1. Choose the desired item and open Sign the Selected Item following the steps in Section 3.4.5, [Adding Electronic Signatures and Comments to Items](#).
2. Choose the History tab (Figure 3-15).

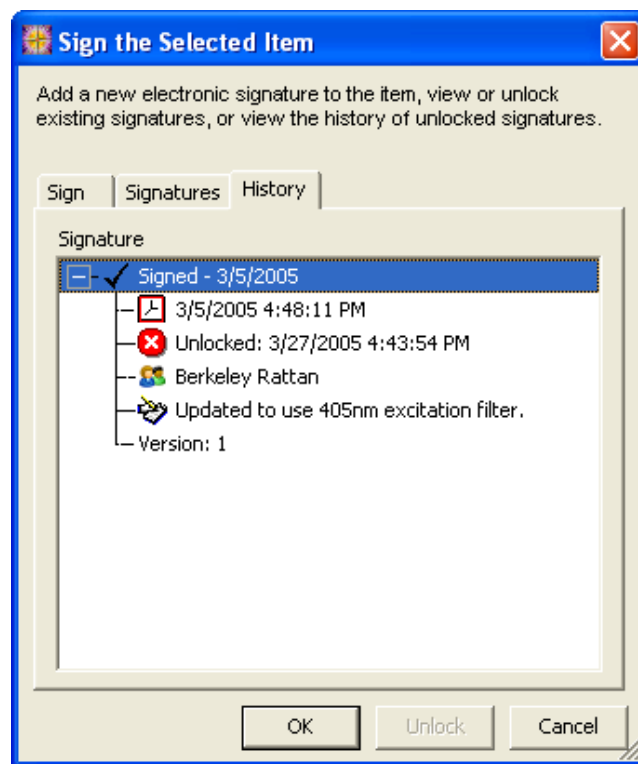


Figure 3-15. Viewing unlocked signatures

3. Click on the + or - to the left of a signature to expand or collapse details about the signature. Details for each signature are listed on four lines:
 - date and time the signature was created
 - date and time the signature was unlocked
 - the full name of the user signing the method
 - comments entered by the user
 - version



4 Creating and Editing Detection Methods

4.1 Overview

Concert - TRIAD Series Software stores measurement configuration parameters in detection methods. Stored parameters include the method technique (for example, absorbance), filter(s) used, and parameters specific to the selected method, such as integration time. The software supports absorbance, luminescence, and fluorescence method techniques. The method techniques available for configuration depend on the capabilities of the instrument being controlled.

Detection methods are created and edited using the Method Editor. Configured detection methods are listed in the Detection Method Selection List and are available for use in measurement protocols (refer to Chapter 6, [Creating Protocols](#)).

Note: When Signet is enabled on the system, only users assigned roles containing the Sign, Copy, Create, Delete, and Edit permissions may perform all of the actions covered in this chapter. Refer to Section 3.3.1.1, [Configuring Roles for Concert - TRIAD Series Software User Accounts](#), for more information about roles and permissions.

To view available detection methods and access the Method Editor:

From the navigation pane, choose **Detection Methods**. The Detection Method Selection List appears (Figure 4-1).

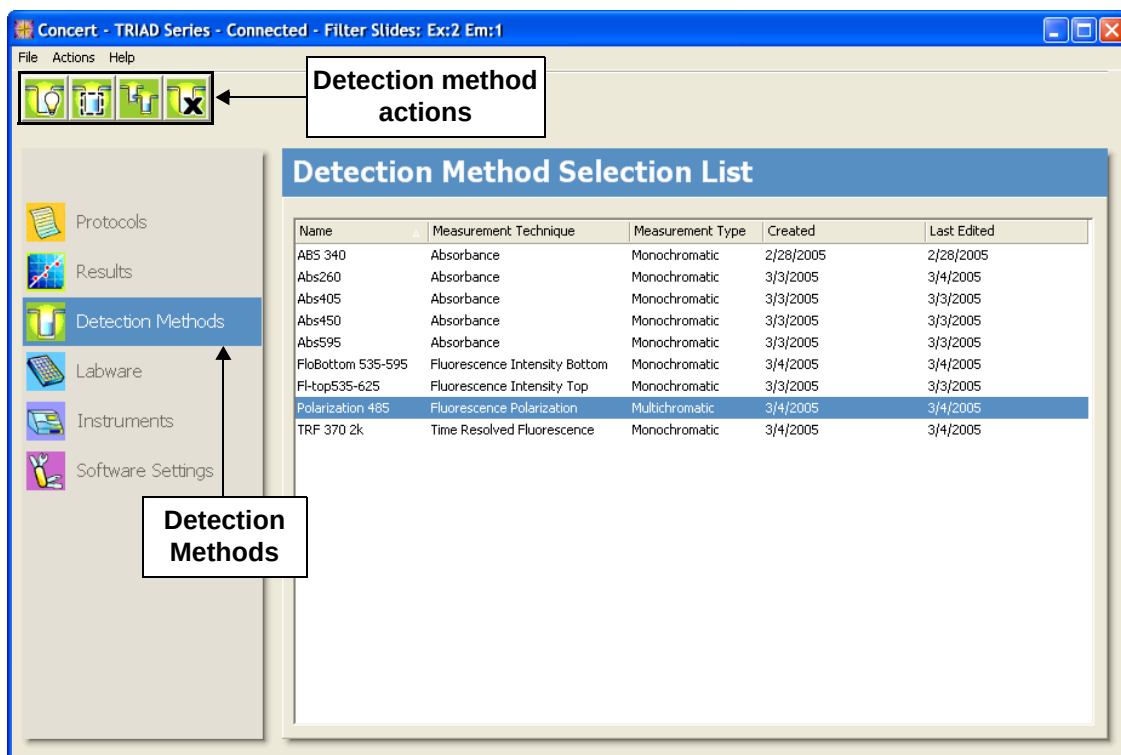


Figure 4-1. Accessing detection method actions

All detection method functions are accessed from the Detection Method Selection List. Available detection method functions are:

- [Creating Detection Methods](#) (Section 4.2).
- [Editing Detection Methods](#) (Section 4.3).
- [Copying Detection Methods](#) (Section 4.4).
- [Deleting Detection Methods](#) (Section 4.5).
- [Exporting and Importing Detection Methods](#) (Section 4.6).

4.2 Creating Detection Methods

Detection methods are created in the Method Editor, which guides the creation process with a wizard-type interface. Creating a new detection method requires:

- [Selecting a Method Technique](#) (Section 4.2.1).
- [Selecting the Method Type](#) (Section 4.2.2). Method Type is configured for absorbance detection methods only.
- [Defining Method Parameters](#) (Section 4.2.3).
- Optionally, [Signing a Detection Method](#) (Section 4.2.4) to prevent methods from being edited or deleted. Methods may be signed only when Signet is enabled on the system.

Note: When Signet is enabled on the system, only users assigned a role containing the Create permission may create new detection methods.

To sign detection methods, users must be assigned a role containing the Sign permission. Refer to Section 3.3.1.1, [Configuring Roles for Concert - TRIAD Series Software User Accounts](#), for more information about roles and permissions.

To create and define a new detection method:



From the toolbar, choose **Create a new method**.

OR

From the Actions menu, choose **Create a new method**.

OR

Right-click in the Detection Method Selection List and choose **Create a new method** from the menu. The Method Editor appears (Figure 4-2).

4.2.1 Selecting a Method Technique

In the Method Editor, the type of detection method to create is selected in Method Technique (Figure 4-2). Only techniques supported by the instrument currently selected in the Instrument Selection List are available for configuration (refer to Chapter 2, [Setting Up and Controlling Instruments](#)).

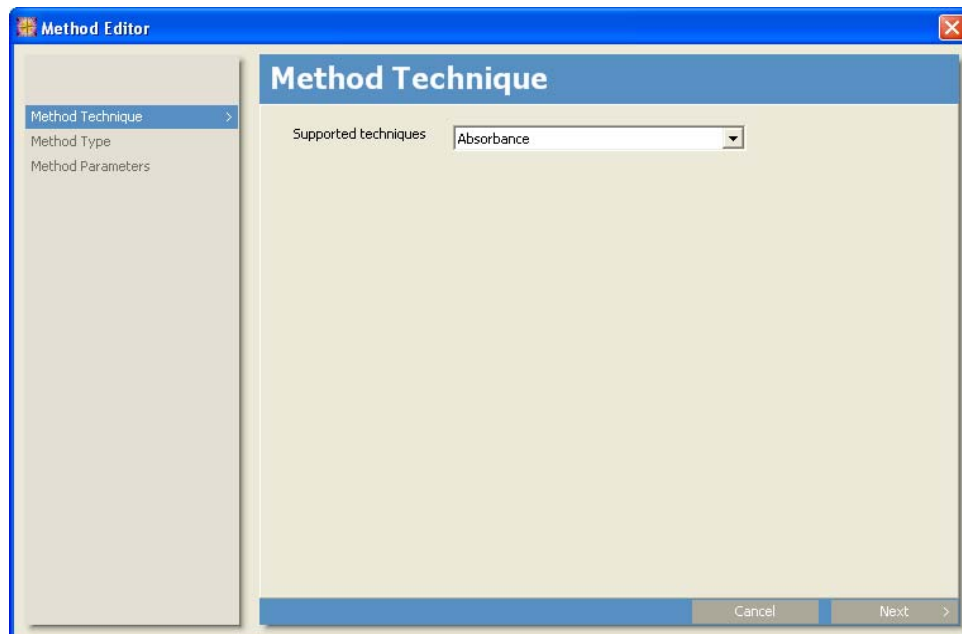


Figure 4-2. Selecting a Method Technique

To select a method technique:

1. In **Supported techniques**, choose the desired detection method.
2. If defining an absorbance method, choose **Next** to select the Method Type (refer to Section 4.2.2, [Selecting the Method Type](#)).

OR

If defining a luminescence or fluorescence method, choose **Next** to define Method Parameters (refer to Section 4.2.3, [Defining Method Parameters](#)).

OR

Choose **Cancel** to close the Method Editor without defining a new detection method.

4.2.2 Selecting the Method Type

When defining an absorbance detection method, use **Method Type** to select whether a monochromatic or bichromatic method will be defined (Figure 4-3). Monochromatic methods perform a single-wavelength measurement. Bichromatic methods perform a second measurement at a reference wavelength, which is subtracted from the first to calculate the final result.

Note: Method Type appears only when defining absorbance methods.

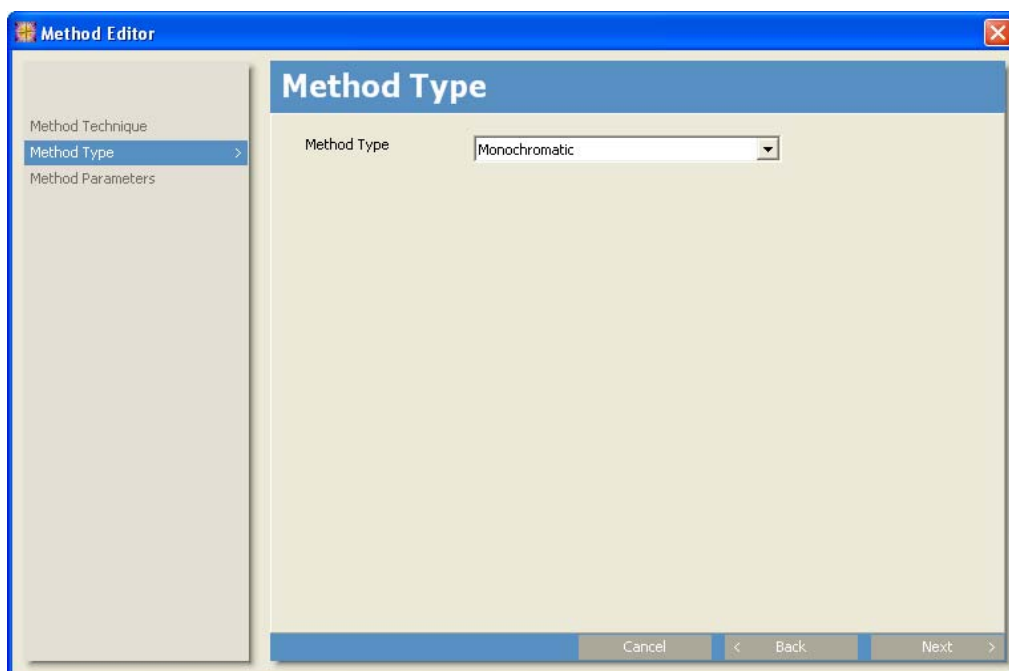


Figure 4-3. Selecting an absorbance Method Type

To select a method type:

1. In **Method Type**, choose the desired method: **Monochromatic** or **Bichromatic**.
2. Choose **Next** to define Method Parameters (refer to Section 4.2.3, [Defining Method Parameters](#)).

OR

Choose **Back** to select a different Method Technique (refer to Section 4.2.1, [Selecting a Method Technique](#)).

OR

Choose **Cancel** to close the Method Editor without defining a new detection method.

4.2.3 Defining Method Parameters

Detection method properties, such as filters and integration time, are defined in Method Parameters. The parameters available for configuration depend on the technique selected in Method Technique (refer to Section 4.2.1, [Selecting a Method Technique](#)).

Use Method Parameters for:

- [Defining Absorbance Method Parameters](#) (Section 4.2.3.1).
- [Defining Luminescence Method Parameters](#) (Section 4.2.3.2).
- [Defining Fluorescence Intensity Top Method Parameters](#) (Section 4.2.3.3).
- [Defining Fluorescence Intensity Bottom Method Parameters \(TRIAD only\)](#) (Section 4.2.3.4).
- [Defining Fluorescence Polarization Method Parameters \(TRIAD only\)](#) (Section 4.2.3.5).
- [Defining Time-Resolved Fluorescence Method Parameters \(TRIAD only\)](#) (Section 4.2.3.6).

4.2.3.1 Defining Absorbance Method Parameters

A monochromatic absorbance method performs an absorbance measurement at a single wavelength. A bichromatic method performs a second measurement at a reference wavelength. This measurement is subtracted from the first to calculate the final result.

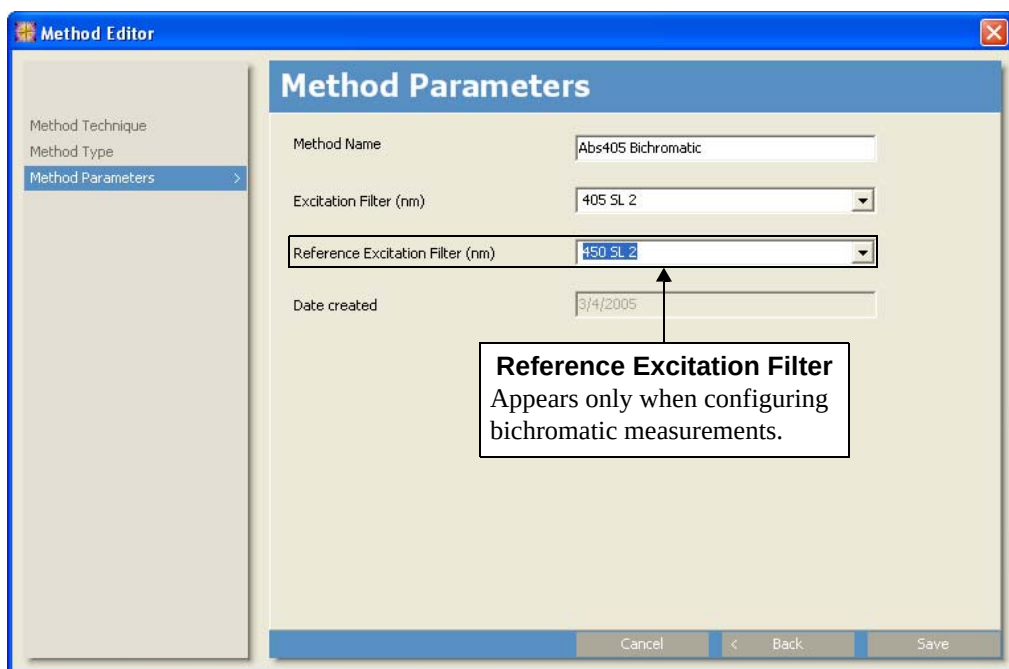


Figure 4-4. Defining absorbance measurement parameters

To define absorbance method parameters:

1. Enter a **Method Name** (Figure 4-4).
2. In Excitation Filter (nm), select the measurement filter.

3. If a bichromatic measurement is being defined, in Reference Excitation Filter (nm), select the reference filter.

Note: The filters available are those installed on the excitation filter slide loaded in the instrument and configured for absorbance techniques in Instrument Settings (refer to Section 2.3.2, [Defining and Editing Filter Slides](#)).

4. Choose **Save** to save the new absorbance detection method. The new method appears in the Detection Method Selection List.

OR

Choose **Back** to define a different Method Type (refer to Section 4.2.2, [Selecting the Method Type](#)).

OR

Choose **Cancel** to close the Method Editor without saving the new detection method.

4.2.3.2 Defining Luminescence Method Parameters

A luminescence method performs glow luminescence measurements on samples. Generally, luminescence measurements do not require a filter; however, cutoff filtration using an emission filter may be specified to eliminate photoluminescence generated by the microplate itself, if desired.

The screenshot shows the 'Method Editor' window with the 'Method Parameters' tab selected. The parameters are as follows:

Parameter	Value
Method Name	Luminescence (glow)
Emission Filter (nm)	0 SL 1
Integration Time (seconds)	0.001
Date created	3/4/2005

At the bottom of the dialog, there are three buttons: 'Cancel', '< Back', and 'Save'.

Figure 4-5. Defining luminescence measurement parameters

To define luminescence method parameters:

1. Enter a **Method Name** (Figure 4-5).

2. In Emission Filter (nm), select **0** when no cutoff filtration is desired. Most luminescence measurements do not require cutoff filtration.

OR

In Emission Filter (nm), select the cutoff filter, if desired.

Note: The filters available are those installed on the emission filter slide loaded in the instrument and configured for luminescence techniques in Instrument Settings (refer to Section 2.3.2, [Defining and Editing Filter Slides](#)).

3. In Integration Time (seconds), enter the length of time, in seconds, the signal is collected from samples. The integration time may be set within the range of 0.00005 to 3600 seconds.
4. Choose **Save** to save the new luminescence detection method. The new method appears in Detection Method Selection List.

OR

Choose **Back** to select a different Method Technique (refer to Section 4.2.1, [Selecting a Method Technique](#)).

OR

Choose **Cancel** to close the Method Editor without saving the new detection method.

4.2.3.3 Defining Fluorescence Intensity Top Method Parameters

In a fluorescence intensity top method, the source light is focused by an objective lens and directed through an excitation filter above the plate. The filter passes only the wavelength necessary to excite samples. The objective lens collects the resulting fluorescence and directs it through an emission filter to separate background light from the specific wavelengths generated by samples. This signal is detected by the photo multiplier tube. When performing a fluorescence intensity top method on a TRIAD, excitation of samples from below the plate is stopped.

The screenshot shows a software window titled "Method Editor: Fluorescence Intensity (top)". On the left is a sidebar with "Method Technique" and "Method Parameters" (selected). The main area is titled "Method Parameters" and contains the following fields:

- Method Name: Fluorescence Intensity (top)
- Excitation Filter (nm): 535 SL 1
- Emission Filter (nm): 595 SL 1
- Integration Time (seconds): 0.001
- Date created: 3/4/2005

At the bottom right are "Cancel" and "Save" buttons.

Figure 4-6. Defining fluorescence intensity top method parameters

To define fluorescence intensity top method parameters:

1. Enter a **Method Name** (Figure 4-6).
2. Select the **Excitation Filter (nm)**.
3. Select the **Emission Filter (nm)**.

Note: The filters available are those installed on the slides loaded in the instrument and configured for fluorescence techniques in Instrument Settings (refer to Section 2.3.2, [Defining and Editing Filter Slides](#)).

4. In Integration Time (seconds), enter the length of time, in seconds, the signal is collected from samples. The integration time may be set within the range of 0.00005 to 3600 seconds.
5. Choose **Save** to save the new fluorescence intensity top detection method. The new method appears in the Detection Method Selection List.

OR

Choose **Back** to select a different Method Technique (refer to Section 4.2.1, [Selecting a Method Technique](#)).

OR

Choose **Cancel** to close the Method Editor without saving the new detection method.

4.2.3.4 Defining Fluorescence Intensity Bottom Method Parameters (TRIAD only)

In a fluorescence intensity bottom method, the source light is directed through an excitation filter, which passes only the wavelengths necessary to excite samples, and focused by an objective lens below the plate. The objective lens collects the resulting fluorescence from below the plate and directs it through an emission filter to separate background light from the specific wavelengths generated by samples. This signal is detected by the photo multiplier tube. When performing a fluorescence intensity bottom method on a TRIAD, excitation of samples from above the plate is stopped.

The screenshot shows a software window titled "Method Editor: Fluorescence Intensity (bottom)". On the left is a sidebar with "Method Technique" and "Method Parameters" (selected). The main area is titled "Method Parameters" and contains the following fields:

- Method Name: Fluorescence Intensity (bottom)
- Excitation Filter (nm): 535 SL 1
- Emission Filter (nm): 625 SL 1
- Integration Time (seconds): 0.001
- Date created: 3/4/2005

At the bottom right of the window are "Cancel" and "Save" buttons.

Figure 4-7. Defining fluorescence intensity bottom method parameters

To define fluorescence intensity bottom method parameters:

1. Enter a **Method Name** (Figure 4-7).
2. Select the **Excitation Filter (nm)**.
3. Select the **Emission Filter (nm)**.

Note: The filters available are those installed on the slides loaded in the instrument and configured for fluorescence techniques in Instrument Settings (refer to Section 2.3.2, [Defining and Editing Filter Slides](#)).

4. In Integration Time (seconds), enter the length of time, in seconds, the signal is collected from samples. The integration time may be set within the range of 0.00005 to 3600 seconds.
5. Choose **Save** to save the new fluorescence intensity bottom detection method. The new method appears in the Detection Method Selection List.

OR

Choose **Back** to select a different Method Technique (refer to Section 4.2.1, [Selecting a Method Technique](#)).

OR

Choose **Cancel** to close the Method Editor without saving the new detection method.

4.2.3.5 Defining Fluorescence Polarization Method Parameters (TRIAD only)

A fluorescence polarization method measures two orthogonal (perpendicular) polarization states by performing two sequential fluorescence intensity measurements from above the plate.

Light is directed through an excitation filter, which passes only the wavelength necessary for excitation, and a polarizing filter. The fluorescence resulting from the excitation of the sample is passed through two emission filters equipped with polarizing filters to distinguish the parallel and perpendicular polarization states.

The polarized signals are then detected sequentially by the photo multiplier tube.

Note: The read direction settings configured in a protocol determine when polarization states are measured during a run (refer to Section 6.2.4.3, [Configuring Reading Direction](#)). When Read by well is selected, both states are measured for each sample before proceeding to the next sample. When Read by row or Read by column is selected, the parallel states are measured for all samples in a row or column before measuring the perpendicular states of the same group of samples.

The screenshot shows the 'Method Editor' window with the 'Method Parameters' tab selected. The parameters are as follows:

Parameter	Value
Method Name	Polarization
Excitation Filter (nm)	485 SL 1
Emission Filter (nm)	535 SL 1
Integration Time (seconds)	0.001
Date created	3/4/2005

At the bottom of the window, there are buttons for 'Cancel', '< Back', and 'Save'.

Figure 4-8. Defining fluorescence polarization method parameters

To define fluorescence polarization parameters:

1. Enter a **Method Name** (Figure 4-8).
2. Select the **Excitation Filter (nm)**.
3. Select the **Emission Filter (nm)**.

Note: The filters available are those installed on the excitation and emission filter slides loaded in the instrument and configured for fluorescence polarization techniques in Instrument Settings (refer to Section 2.3.2, [Defining and Editing Filter Slides](#)).

4. In **Integration Time (seconds)**, enter the length of time, in seconds, the signal is collected from samples. The integration time may be set within the range of 0.00005 to 3600 seconds.

5. Choose **Save** to save the new fluorescence polarization detection method. The new method appears in the Detection Method Selection List.

OR

Choose **Back** to select a different Method Technique (refer to Section 4.2.1, [Selecting a Method Technique](#)).

OR

Choose **Cancel** to close the Method Editor without saving the new detection method.

4.2.3.6 Defining Time-Resolved Fluorescence Method Parameters (TRIAD only)

In a time-resolved fluorescence measurement, the excitation light source is turned off and the measurement is performed from above the plate after a specified delay. Several of these excitation/measurement cycles may be performed on each sample. When multiple excitation/measurement cycles are performed, the results from all cycles are used to calculate a single measurement result for each sample.

The screenshot shows the 'Method Editor: Fluorescence (TRF)' window. On the left, a sidebar lists 'Method Technique' and 'Method Parameters', with the latter selected. The main panel, titled 'Method Parameters', contains the following fields and values:

Parameter	Value
Method Name	Fluorescence (TRF)
Excitation Filter (nm)	370 SL 1
Emission Filter (nm)	625 SL 1
LED on Time (seconds)	0.0001
Number of pulses	1000
Delay Before Measure (seconds)	0.00001
Integration Time (seconds)	0.00089
Date created	3/4/2005

At the bottom right of the main panel are 'Cancel' and 'Save' buttons.

Figure 4-9. Defining time-resolved fluorescence method parameters

To define time-resolved fluorescence parameters:

1. Enter a **Method Name** (Figure 4-9).
2. Select the **Excitation Filter (nm)**.
3. Select the **Emission Filter (nm)**.

Note: The filters available are those installed on the excitation and emission filter slides loaded in the instrument and configured for time-resolved fluorescence techniques in Instrument Settings (refer to Section 2.3.2, [Defining and Editing Filter Slides](#)).

4. In **LED on Time (seconds)**, enter the length of time, in seconds, that the LED light source remains turned on.
5. In **Number of Pulses**, enter the number of excitation/measurement cycles performed in the measurement. The number of pulses sets the exposure received by samples during measurements.
6. In **Delay Before Measure (seconds)**, enter the interval, in seconds, between switching off the light source and performing the measurement. The delay may be set within the range of 0.000001 to 0.0075 of a second.
7. In **Integration Time (seconds)**, enter the length of time, in seconds, each sample is measured. The integration time may be set within the range of 0.00005 to 0.0075 of a second.
8. Choose **Save** to save the new time-resolved fluorescence detection method. The new method appears in the Detection Method Selection List.

OR

Choose **Back** to select a different Method Technique (refer to Section 4.2.1, [Selecting a Method Technique](#)).

OR

Choose **Cancel** to close the Method Editor without saving the new detection method.

4.2.4 Signing a Detection Method

When Signet is enabled on the system, detection methods may be signed to prevent method properties from being edited or methods from being deleted. Detection methods may be signed at any time after the configuration is complete.

Detection methods may be signed by users who are assigned a role containing the Sign permission. Refer to Section 3.3.1.1, [Configuring Roles for Concert - TRIAD Series Software User Accounts](#), for more information about roles and permissions.

To sign labware:

1. In the Detection Method Selection List, select the detection method to sign.
2. From the toolbar, choose **Sign the selected method**. Sign the Selected Item appears.



OR

From the Actions menu, choose **Sign the selected method**.

OR

Right click on the selected labware and choose **Sign the selected method**.

3. In Sign the Selected Item, add comments and an electronic signature by following the instructions in Section 3.4.5, [Adding Electronic Signatures and Comments to Items](#).

4.3 Editing Detection Methods

Parameters configured in user-defined detection methods may be edited; however, the method technique may not be changed. Default methods installed with the software and methods used in protocols may be edited, but not renamed.

Note: When Signet is enabled on the system, only users assigned a role containing the Delete permission may delete user-defined detection methods. Signed methods may not be deleted. Refer to Section 3.3.1.1, [Configuring Roles for Concert - TRIAD Series Software User Accounts](#), for more information about roles and permissions.

To edit a detection method:

1. In the Detection Method Selection List, select the detection method to edit.
2. From the toolbar, choose **Edit the selected method**.



OR

From the Actions menu, choose **Edit the selected method**.

OR

Right-click on the selected detection method and choose **Edit the selected method** from the menu. The Method Editor appears (Figure 4-10).

Method Editor: Fluorescein Top

Method Parameters

Method Name	Fluorescein Top
Excitation Filter (nm)	485 SL 1
Emission Filter (nm)	535 SL 1
Integration Time (seconds)	0.001
Date created	3/4/2005

Cancel Save

Figure 4-10. Editing a fluorescence intensity top method

3. Edit the method parameters as desired. For more information about the parameters for a specific detection method, refer to the section that covers defining the desired detection method:
 - [*Defining Absorbance Method Parameters*](#) (Section 4.2.3.1).
 - [*Defining Luminescence Method Parameters*](#) (Section 4.2.3.2).
 - [*Defining Fluorescence Intensity Top Method Parameters*](#) (Section 4.2.3.3).
 - [*Defining Fluorescence Intensity Bottom Method Parameters \(TRIAD only\)*](#) (Section 4.2.3.4).
 - [*Defining Fluorescence Polarization Method Parameters \(TRIAD only\)*](#) (Section 4.2.3.5).
 - [*Defining Time-Resolved Fluorescence Method Parameters \(TRIAD only\)*](#) (Section 4.2.3.6).
4. Choose **Save** to close the Method Editor and save the changes.
OR
Choose **Cancel** to close the Method Editor without saving changes.

4.4 Copying Detection Methods

Copies may be made of existing detection methods. After a copy has been created, it may be used as a template for a new detection method using the same method technique.

Note: When Signet is enabled on the system, only users assigned a role containing the Copy permission may create copies of detection methods. Refer to Section 3.3.1.1, [Configuring Roles for Concert - TRIAD Series Software User Accounts](#), for more information about roles and permissions.

To make a copy of a detection method:

1. In the Detection Method Selection List, select the detection method to copy.
2. From the toolbar, choose **Make a copy of the selected method**.



OR

From the Actions menu, choose **Make a copy of the selected method**.

OR

Right-click on the selected detection method and choose **Make a copy of the selected method** from the menu that appears.

Note: The default name format for copied detection methods is Copy of OriginalName. To change the name, edit the detection method (refer to Section 4.3, [Editing Detection Methods](#)).

4.5 Deleting Detection Methods

User-defined detection methods may be deleted from the Detection Method Selection List. Some detection methods may not be deleted, including:

- methods used in protocols.
- default methods installed with Concert - TRIAD Series Software.
- methods signed on systems with the optional Signet enabled.

Note: When Signet is enabled on the system, only users assigned a role containing the Delete permission may delete user-defined detection methods. Refer to Section 3.3.1.1, [Configuring Roles for Concert - TRIAD Series Software User Accounts](#), for more information about roles and permissions.

To delete a detection method:

1. In the Detection Method Selection List, select the detection method to delete.
2. From the toolbar, choose **Delete the selected method**.



OR

From the Actions menu, choose **Delete the selected method**.

OR

Right-click on the selected detection method and choose **Delete the selected method** from the menu. Message appears (Figure 4-11).

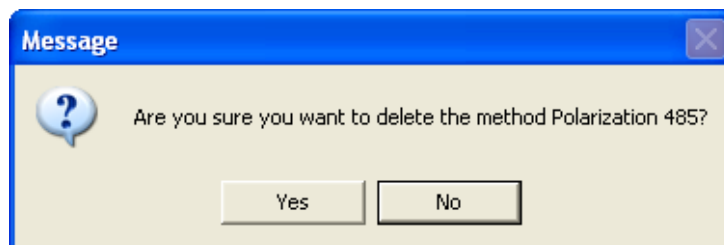


Figure 4-11. Confirming the deletion of a detection method

3. Choose **Yes** to delete the selected detection method.

OR

Choose **No** to cancel the deletion.

4.6 Exporting and Importing Detection Methods

A user-defined detection method can be exported to an XML file and imported later to restore that configuration or share it with a copy of Concert - TRIAD Series Software installed on another system.

Default detection methods installed with Concert - TRIAD Series Software are present on all systems and may not be deleted or overwritten. For this reason, importing default detection methods from an XML export file is not permitted.

Note: When Signet is enabled, signed detection methods may be exported for use on another system; however, electronic signatures are not retained, which allows the protocol to be edited when imported to another system. Importing a signed method to the system from which it was originally exported is not permitted because signed methods may not be deleted or overwritten.

To export a detection method:

1. In the Detection Method Selection List, select the detection method to export.
2. From the File menu, choose **Export>Detection Method**. Browse for Folder appears (Figure 4-12).

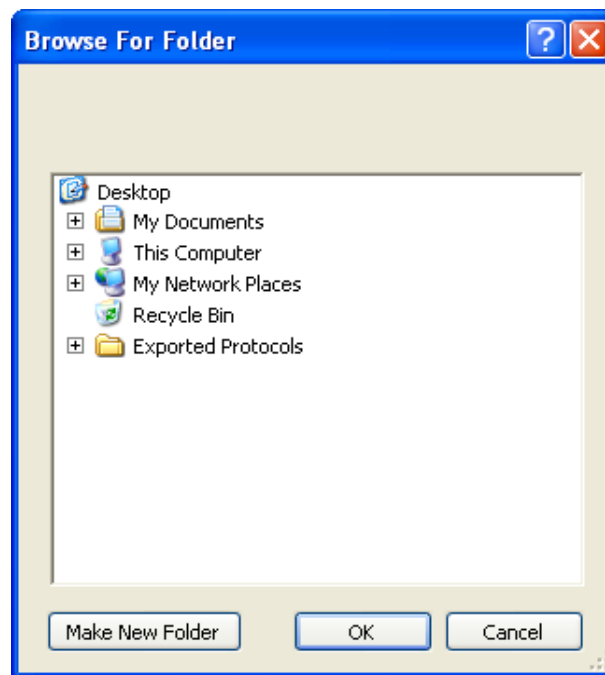


Figure 4-12. Choosing the folder where an exported detection method will be saved

3. In Browse for Folder, browse to the folder where the exported detection method will be saved.

OR

Choose **Make New Folder** to create a new folder where the exported detection method will be saved.

4. Choose **OK** to export the detection method. The exported detection method is saved using the default file name format, *Method__MethodName.xml*. In order to import the file at a later date, the filename must not be changed.

OR

Choose **Cancel** to stop the operation without exporting the detection method.

To import a detection method from an exported XML file:

1. From the **File** menu, choose **Import>Detection Method**. **Open** appears.
2. In **Open**, browse to and select the desired XML file to import.
3. Choose **Open**. The detection method is imported to the Detection Method Selection List.

5 Creating and Editing Labware

5.1 Overview

Concert - TRIAD Series Software supports a wide range of labware, with many common microplate formats already preconfigured and ready for use in protocols. Configured labware types are listed in the Labware Selection List and are available for use in protocols.

New labware types may be created at any time using the Labware Editor. The Labware Editor also provides the ability to edit and delete existing labware types not used in protocols, make copies of labware types, and optimize labware dimensions to compensate for slight dimensional variations that may exist between production lots.

The types of labware supported depend on the capabilities of the instrument:

- **TRIAD LT** — supports 96-well and 384-well microplates.
- **TRIAD** — supports 6- to 384-well microplates.

Note: When Signet is enabled on the system, only users assigned roles containing the Sign, Copy, Create, Delete, Optimize, and Edit permissions may perform all of the actions covered in this chapter. Refer to Section 3.3.1.1, [Configuring Roles for Concert - TRIAD Series Software User Accounts](#), for more information about roles and permissions.

Labware actions are accessed from the Labware Selection List (Figure 5-1). Labware actions include:

- [Creating Labware](#) (Section 5.2).
- [Editing Labware](#) (Section 5.3).
- [Copying Labware](#) (Section 5.4).
- [Deleting Labware](#) (Section 5.5).
- [Optimizing Labware](#) (Section 5.6).
- [Exporting and Importing Labware](#) (Section 5.7).

To define and edit labware:

From the navigation pane, choose **Labware**. The Labware Selection List appears (Figure 5-1).

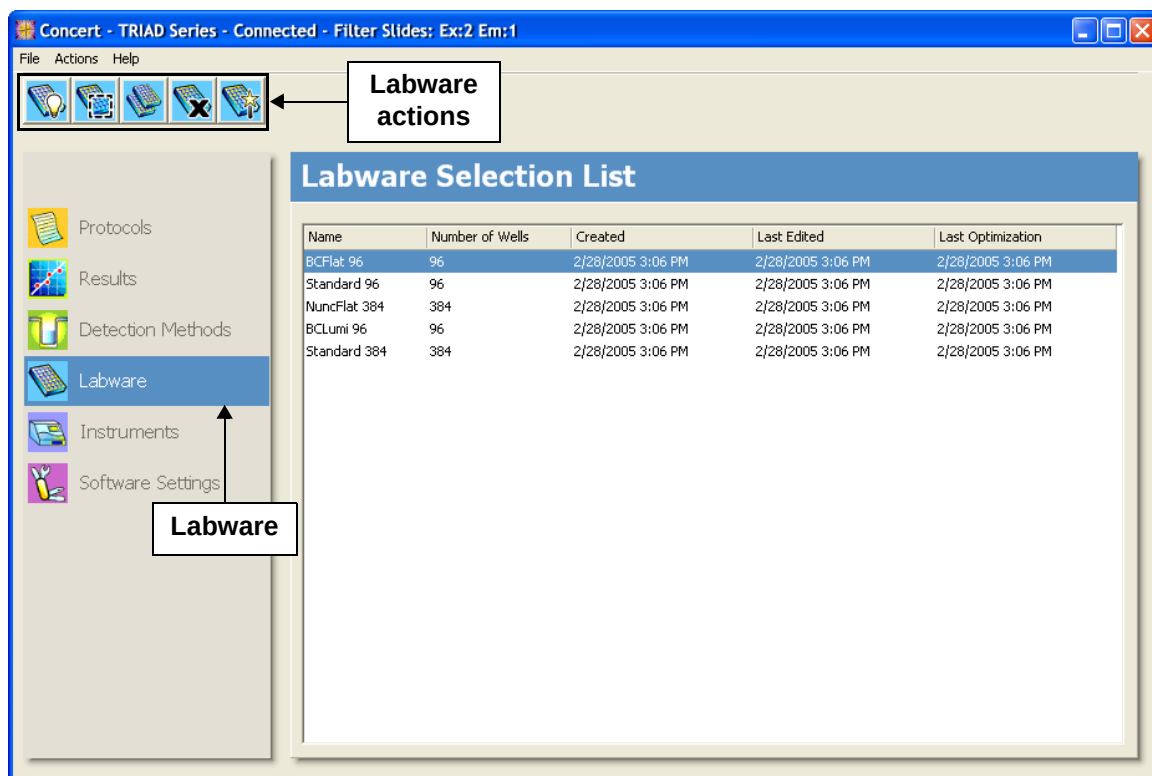


Figure 5-1. Accessing labware actions

5.2 Creating Labware

New types of labware are created in the Labware Editor, which guides the creation process with a wizard-type interface. Creating labware includes:

- [Defining Labware Information](#) (Section 5.2.1).
- [Configuring Offsets and Well Dimensions for the Default Labware Lot](#) (Section 5.2.2).
- Optionally, [Signing Labware](#) (Section 5.2.3) to prevent labware from being edited or deleted. Labware may be signed only when Signet is enabled on the system.

Note: When Signet is enabled on the system, only users assigned a role containing the Create permission may create new labware definitions.

To sign labware, users must be assigned a role containing the Sign permission. Refer to Section 3.3.1.1, [Configuring Roles for Concert - TRIAD Series Software User Accounts](#), for more information about roles and permissions.

To create and define new labware:



From the toolbar, choose **Create a new labware type**. The Labware Editor appears (Figure 5-2).

OR

From the Actions menu, choose **Create a new labware type**.

OR

Right-click in the Labware Selection List and choose **Create a new labware type** from the menu.

5.2.1 Defining Labware Information

Use Labware Information to define labware names, dimensions, well parameters, and supported measurement techniques (Figure 5-2).

Labware Editor: Weber96deep

Labware Information

Labware Information >
Labware Lots

Property grid

Labware Info

Date created	3/3/2005
Date edited	3/3/2005
Plate Name	Weber96deep

Labware Measurements

Height	1.4
Height with lid	2.222
Length	12.77
Reading height	1.06
Width	8.57

Well Info

Columns	12
Rows	8
Well bottom shape	Flat
Well shape	Round
Well volume	300

Plate Name
Name of this labware.

Supported techniques

- ☒ Absorbance
- ☐ Luminescence
- ☐ LuminescenceGlow
- ☐ LuminescenceFlash
- ☐ Bio Luminescence RET
- ☐ Fluorescence RET
- ☒ Fluorescence Intensity Top
- ☒ Fluorescence Intensity Bottom
- ☐ Fluorescence Polarization
- ☐ Time Resolved Fluorescence

Information about the field being configured.

Notes
None

Cancel Next >

Figure 5-2. Defining plate dimensions and information

To define Labware Information:

1. If necessary, click the **+** next to Labware Info to display the fields in the category.
2. Enter the **Plate Name**. A name must be entered to proceed to the second configuration screen, Labware Lots.
3. If necessary, click the **+** next to Labware Measurements to display the fields in the category.

Note: More information about the field being defined is displayed below the property grid (Figure 5-2).



CAUTION: The plate height configured must not be less than that of the actual plate. Doing so may cause the TRIAD optics transport to collide with the plate during a Read Height Optimization.

4. Enter the **Height** of the plate. All labware dimensions are entered in centimeters.
5. Enter the **Height with lid**.
6. Enter the **Length** of the plate.
7. In Reading height, enter the height from the top of the plate at which the plate is read.

8. Enter the **Width** of the plate.
9. If necessary, click the **+** next to **Well Info** to display the fields in the category.
10. Enter the number of **Columns** on the plate.
11. Enter the number of **Rows** on the plate.
12. Click in either column of **Well bottom shape**, then click on the down arrow and choose the shape of well bottoms: **Flat**, **Cone**, or **Round**.
13. Click in either column of **Well shape**, then click on the down arrow and choose the shape of the wells: **Round**, **Square**, or **Cone**.
14. Enter the maximum **Well volume** in microliters.
15. In **Supported Techniques**, select all measurement techniques compatible with the plate being defined. The labware being configured will only be available for use in protocols configured with compatible measurement techniques.

Note: Refer to Section 5.2.1.1, [General Labware Selection Guidelines](#) for more information about choosing the appropriate labware for the desired techniques.

16. In **Notes**, enter information about the labware or configuration, if desired.
17. Choose **Next** to define the default row and column offsets and well dimensions for the labware type in Labware Lots (refer to Section 5.2.2, [Configuring Offsets and Well Dimensions for the Default Labware Lot](#)).

OR

Choose **Cancel** to close the Labware Editor without creating or saving new labware.

5.2.1.1 General Labware Selection Guidelines

When creating labware, select only measurement techniques compatible with the microplate being defined. Each measurement technique requires labware of a specific color and/or material be used.

Table 5-1 provides general labware color and material guidelines for each measurement technique. Along with these basic guidelines, always select microplates with a surface treatment suitable for the desired application, and follow any additional guidelines provided by the plate manufacturer.

Table 5-1. General Microplate selection guidelines

Measurement Technique	Supported Plate Color	Additional Considerations
Absorbance	clear, white with clear bottom, or black with clear bottom	Clear polystyrene or film plates with transparent bottoms are suitable. Polypropylene or PVC plates do not provide sufficient optical quality.
Luminescence Glow Type	solid black or solid white	Black plates are recommended unless the signal is weak enough to require the higher sensitivity of white plates. However, with strong signals, white plates may produce crosstalk.
Fluorescence Intensity Top	solid black	N/A
Fluorescence Intensity Bottom	black with clear bottom	N/A
Fluorescence Polarization	solid black	Microplates must not be covered with a lid or plastic film during fluorescence polarization measurements.
Time-Resolved Fluorescence	solid white	N/A

5.2.2 Configuring Offsets and Well Dimensions for the Default Labware Lot

Use Labware Lots to define row and column offsets and well dimensions (Figure 5-3). The offsets and dimensions entered when new labware is created define the default labware lot (DefaultLot). After the new labware has been saved, additional lots may be created by optimizing the labware to compensate for dimensional variations between different production lots (refer to Section 5.6, [Optimizing Labware](#)).

In Labware Lots, x and y offsets are defined for all four corners of the labware. An x offset is the distance from the edge of the microplate to the center of wells on the first row; a y offset is the distance from the edge of plate to the center of wells in the first column. Well dimensions defined include well depth, length, and width, as well as distances between rows and columns.

To configure offsets and well dimensions:

1. If necessary, click the + next to Labware Lot Measurements to display the fields in the category. More information about the field being defined is displayed below the property grid (Figure 5-3).

Note: The fields in Labware Lot Info may not be configured when creating new labware.

2. Enter column and row x and y offsets for each of the four corner wells. *All* offsets and well dimensions are entered in centimeters.

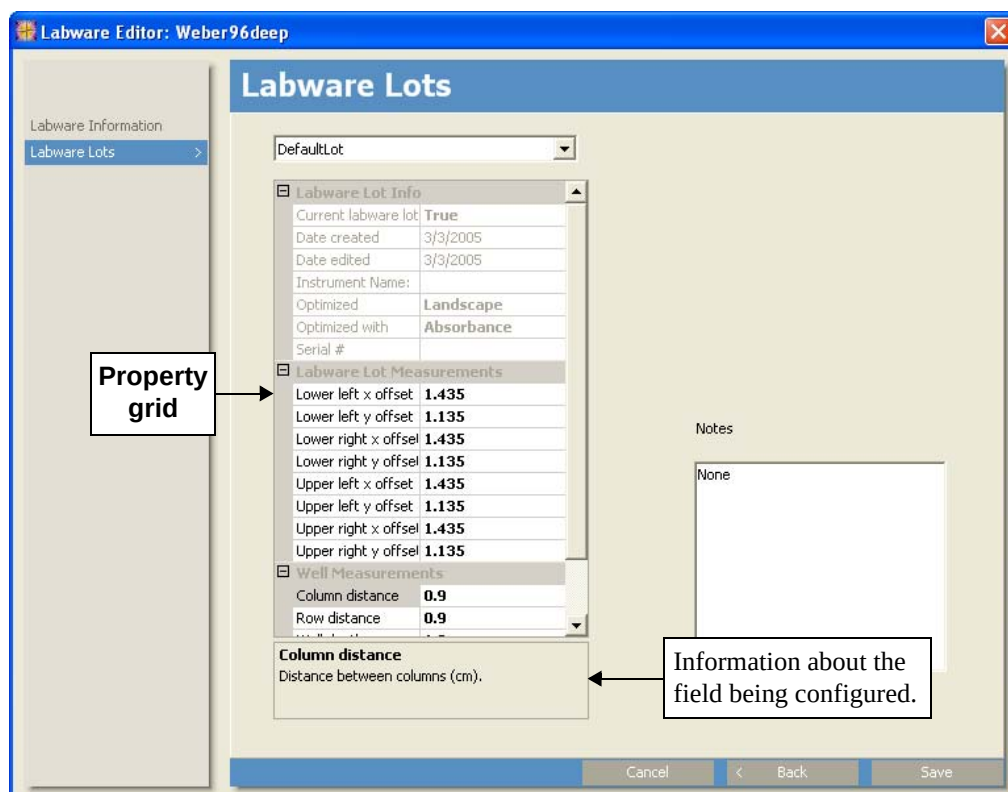


Figure 5-3. Defining offsets and well dimensions

3. If necessary, click the + next to Well Measurements to display the fields in the category.

4. In **Column Distance**, enter the distance between columns.
5. In **Row Distance**, enter the distance between rows.
6. Enter the **Well depth**.
7. In **Well Length**, enter the diameter of the well in the direction of the columns on the plate.
8. In **Well Width**, enter the diameter of the well in the direction of the rows on the plate.
9. In **Notes**, enter information about the labware lot or configuration, if desired.
10. Choose **Save** to save the new labware and close the Labware Editor.

OR

Choose **Back** to edit Plate Information (refer to Section 5.2.1, [Defining Labware Information](#)).

OR

Choose **Cancel** to close the Labware Editor without creating new labware.

5.2.3 Signing Labware

When Signet is enabled on the system, labware may be signed to prevent labware properties from being edited. Signed labware may not be optimized to create new labware lots unless all signatures attached to the labware are unlocked, which changes the labware status to unsigned.

Labware may be signed by users who are assigned a role containing the Sign permission. Refer to Section 3.3.1.1, [Configuring Roles for Concert - TRIAD Series Software User Accounts](#), for more information about roles and permissions.

To sign labware:

1. In the Labware Selection List, select the labware type to sign.
2. From the toolbar, choose **Sign the selected labware type**. Sign the Selected Item appears.



OR

From the Actions menu, choose **Sign the selected labware type**.

OR

Right click on the selected labware and choose **Sign the selected labware type**.

3. In Sign the Selected Item, add an electronic signature by following the instructions in Section 3.4.5, [Adding Electronic Signatures and Comments to Items](#).

5.3 Editing Labware

Dimensions and information for user-defined labware not used in measurement protocols may be edited. Dimensions and information may be viewed, but not edited, for:

- default labware installed with Concert - TRIAD Series Software.
- labware used in protocols.
- labware that has been signed on a system with the optional Signet enabled.

Note: When Signet is enabled on the system, only users assigned a role containing the Edit permission may edit labware definitions. Refer to Section 3.3.1.1, [Configuring Roles for Concert - TRIAD Series Software User Accounts](#), for more information about roles and permissions.

All labware in the Labware Selection List may be optimized to create new labware lots (refer to Section 5.6, [Optimizing Labware](#)). Labware lots compensate for dimensional variations between production lots. When multiple lots exist for a labware type, the active lot may be changed. Labware lot properties may be edited for all labware types except those that have been signed.

Labware is edited in the Labware Editor (Figure 5-4). Editing includes:

- [Viewing and Editing Labware Information](#) (Section 5.3.1).
- [Selecting and Editing Labware Lots](#) (Section 5.3.2).

To view and edit labware dimensions and information:

1. In the Labware Selection List, select the labware to edit.
2. From the toolbar, choose **Edit the selected labware type**.



OR

From the ACTIONS menu, choose **Edit the selected labware type**.

OR

Right-click on the selected labware and choose **Edit the selected labware type** from the menu that appears.

5.3.1 Viewing and Editing Labware Information

Use Labware Information to view and edit labware dimensions, information, and supported techniques. Plate information for default labware included in the software installation and labware used in protocols may be viewed, but not edited.

Figure 5-4. Editing labware dimensions and well information

To edit labware information:

1. In the property grid, edit labware dimensions and information as desired. Refer to Section 5.2.1, [Defining Labware Information](#), for more information about the fields available in the property grid.
2. In Supported Techniques, change the measurement techniques supported by the labware, if desired.

Note: Refer to Section 5.2.1.1, [General Labware Selection Guidelines](#) for more information about labware/technique compatibility.

3. Edit the labware **Notes**, if desired.
4. Choose **Next** to select and edit labware lots and save changes made to the labware (refer to Section 5.3.2, [Selecting and Editing Labware Lots](#)).

OR

Choose **Cancel** to close the Labware Editor without saving changes.

5.3.2 Selecting and Editing Labware Lots

Use Labware Lots to select the active lot and/or edit and save changes made in the Labware Editor (Figure 5-5). Lots can be selected and edited for all labware, including labware used in measurement protocols.

Note: Labware Lots are created by optimizing labware (refer to Section 5.6, [Optimizing Labware](#)).

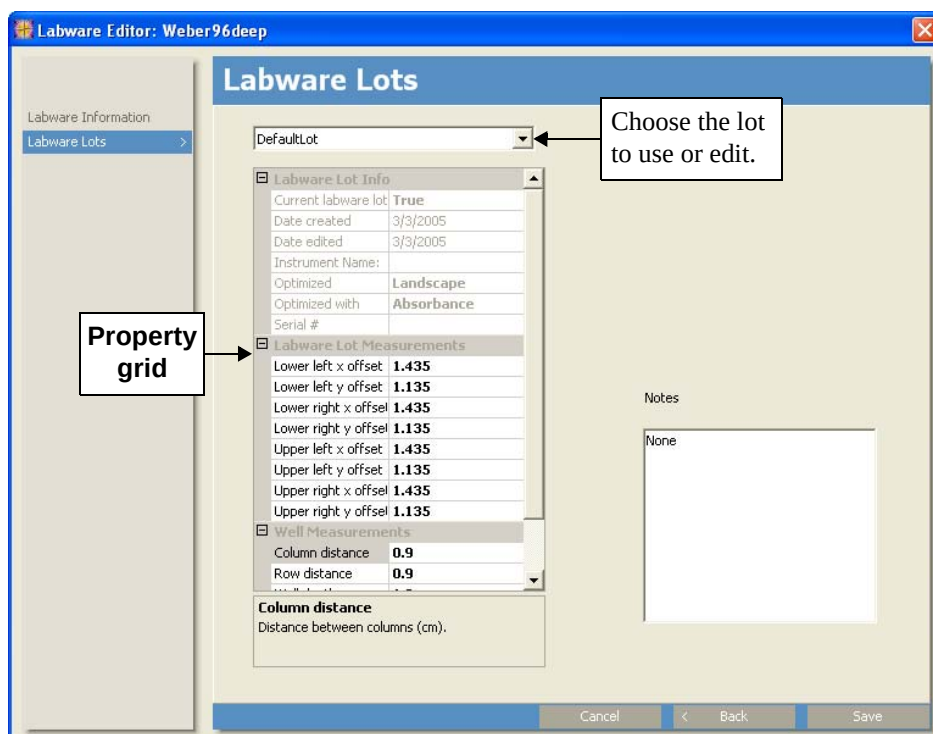


Figure 5-5. Configuring offsets and well dimensions in Labware Lots

To select and edit lots:

1. From the pull-down menu, choose the lot to use or edit. The default lot created when the labware was defined and all lots configured using [Optimizing Labware](#) are available (refer to Section 5.6, [Optimizing Labware](#)).
2. Click in Current labware lot and choose **True**, if necessary. True must be selected in order to save changes made to the labware lot.
3. In the property grid, edit lot dimensions and information as desired. Refer to Section 5.2.2, [Configuring Offsets and Well Dimensions for the Default Labware Lot](#), for more information about the fields available in the property grid.
4. Edit the lot **Notes**, if desired.
5. Choose **Save** to save changes made in the Labware Editor.

OR

Choose **Back** to view or edit Plate Information (refer to Section 5.3.1, [Viewing and Editing Labware Information](#)).

OR

Choose **Cancel** to close the Labware Editor without saving changes.

5.4 Copying Labware

Labware can be copied and then used as a template for a new labware type by editing the dimensions and parameters in the Labware Editor (refer to Section 5.3, [Editing Labware](#)).

Note: When Signet is enabled on the system, only users assigned a role containing the Copy permission may create copies of labware definitions. Refer to Section 3.3.1.1, [Configuring Roles for Concert - TRIAD Series Software User Accounts](#), for more information about roles and permissions.

To make a copy of a labware type:

1. In the Labware Selection List, select the labware type to copy.
2. From the toolbar, choose **Make a copy of the selected labware type**.



OR

From the Actions menu, choose **Make a copy of the selected labware type**.

OR

Right-click on the selected labware type and choose **Make a copy of the selected labware type** from the menu that appears.

Note: The default name format for copied labware types is Copy of OriginalName. To change the name, edit the labware type (refer to Section 5.3, [Editing Labware](#)).

5.5 Deleting Labware

User-defined labware may be deleted from the Labware Selection List. Some labware may not be deleted:

- labware used in protocols.
- default labware installed with Concert - TRIAD Series Software.
- labware that has been signed on a system with the optional Signet enabled.

Note: When Signet is enabled on the system, only users assigned a role containing the Delete permission may delete user-defined labware. Refer to Section 3.3.1.1, [Configuring Roles for Concert - TRIAD Series Software User Accounts](#), for more information about roles and permissions.

To delete labware:

1. In the Labware Selection List, select the labware to delete.
2. From the toolbar, choose **Delete the selected labware type**.



OR

From the Actions menu, choose **Delete the selected labware type**.

OR

Right-click on the selected labware and choose **Delete the selected labware type** from the menu that appears. **Message** appears (Figure 5-6).

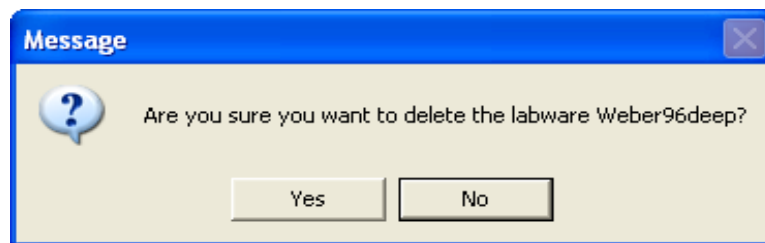


Figure 5-6. Confirming a labware deletion

3. Choose **Yes** to delete the selected labware.
- OR
- Choose **No** to cancel the deletion.

5.6 Optimizing Labware

Microplate dimensions may vary slightly between production lots, which potentially affects measurement accuracy. Concert - TRIAD Series Software allows labware dimensions to be optimized by determining the centers of the four corner wells on the plate. Each time a labware type is optimized, a new labware lot is created with dimensions specific to that lot.

Note: When Signet is enabled on the system, only users assigned a role containing the Optimize permission may optimize labware to create new labware lots. Refer to Section 3.3.1.1, [Configuring Roles for Concert - TRIAD Series Software User Accounts](#), for details about permissions.

New labware lots may be created by optimizing labware for labware types that have been signed (refer to Section 5.2.3, [Signing Labware](#)).

Labware is optimized in Optimizing Labware (Figure 5-7), which guides the process with a wizard-type interface. Optimizing labware includes:

- [Selecting the Detection Method](#) (Section 5.6.1).
- [Preparing and Loading the Labware](#) (Section 5.6.2).
- [Performing the Optimization Read](#) (Section 5.6.3).
- [Selecting the Centers of the Four Corner Wells](#) (Section 5.6.4).
- [Verifying Well Centers](#) (Section 5.6.5).

To optimize labware:

1. In the Labware Selection List, select the labware to optimize.



2. From the toolbar, choose **Optimize the selected labware type**.

OR

From the ACTIONS menu, choose **Optimize the selected labware type**.

OR

Right-click on the selected labware and choose **Optimize the selected labware type** from the menu that appears.

5.6.1 Selecting the Detection Method

Labware is optimized by performing measurements of the four corner wells of the microplate and then defining the well centers using images of the wells generated by the measurements. To ensure the most accurate optimization is performed, use **Select Detection Method** to select the most appropriate detection method for the optimization (Figure 5-7).

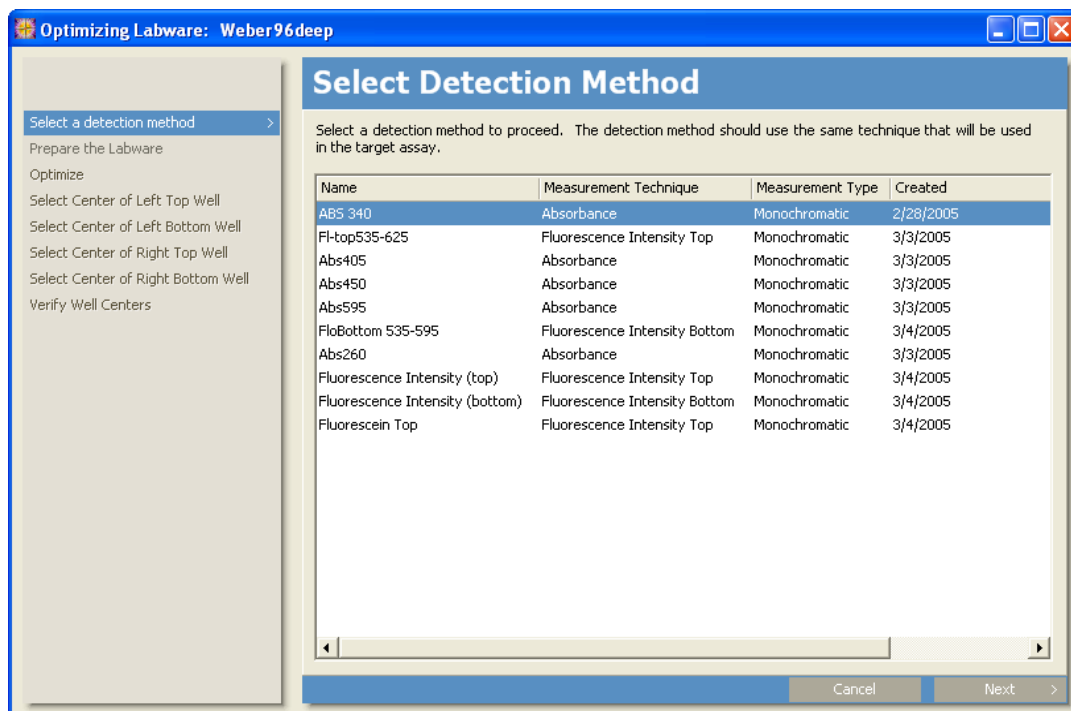


Figure 5-7. Selecting the detection method for labware optimization

To select the detection method:

1. To optimize labware for use in absorbance, fluorescence intensity, or luminescence protocols, choose a detection method configured in the protocol.

OR

To optimize labware for use in fluorescence polarization or time-resolved fluorescence protocols, choose a fluorescence intensity top method at a similar wavelength to the polarization or TRF measurement(s) configured in the protocol.

2. Choose **Next** to Prepare Labware (refer to Section 5.6.2, [Preparing and Loading the Labware](#)).

OR

Choose **Cancel** to close Optimizing Labware without performing the optimization.

5.6.2 Preparing and Loading the Labware

Labware dimensions are optimized by reading the four corner wells of the plate. Prepare Labware provides controls to load and eject labware from the instrument and to choose the orientation of the plate on the microplate carrier (Figure 5-8).

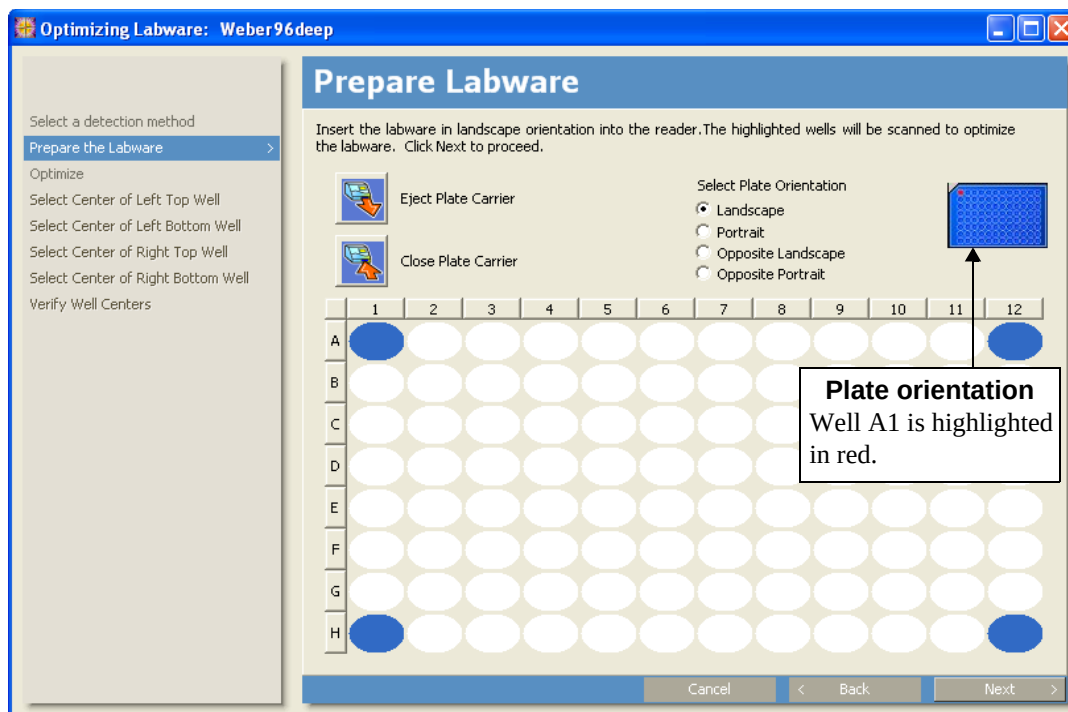


Figure 5-8. Preparing the labware for optimization

To prepare labware for optimization:



1. Choose **Eject Plate Carrier** to move the microplate carrier outside the instrument.
2. Fill the corner wells of the plate with identical samples. To ensure accuracy, samples must be appropriate for the selected detection method. Sample concentration and volume must be identical in each well.
3. Place the microplate to be optimized on the plate carrier.



4. Choose **Close Plate Carrier** to load the microplate into the instrument.
5. In **Select Plate Orientation**, choose the orientation of the plate on the microplate carrier. The selected orientation is displayed graphically to the right of the screen, with well A1 highlighted in red.
6. Choose **Next** to start the optimization (refer to Section 5.6.3, [Performing the Optimization Read](#)). The optimization read begins automatically.

OR

Choose **Back** to select a different detection method (refer to Section 5.6.1, [Selecting the Detection Method](#)).

OR

Choose **Cancel** to close Optimizing Labware without performing the optimization.

5.6.3 Performing the Optimization Read

Optimization in Progress displays the status of the optimization read and provides the ability to cancel the optimization in progress (Figure 5-9). The optimization read requires several minutes to complete.

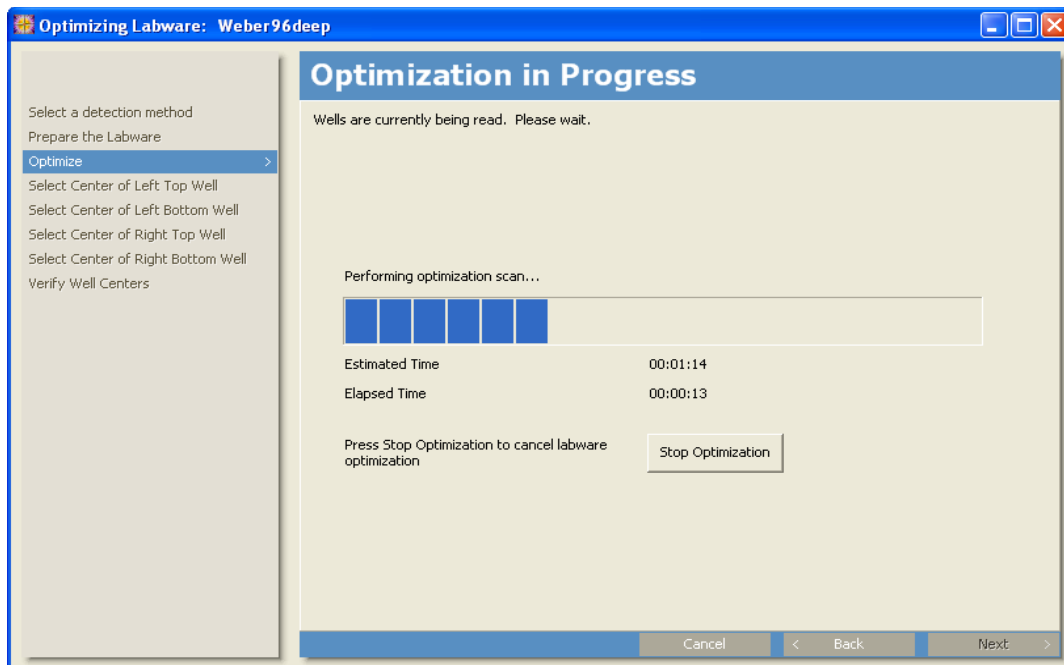


Figure 5-9. Labware optimization in progress

During the optimization read:

Choose **Stop Optimization** to cancel the optimization process and close Optimizing Labware without saving the optimization data.

When the optimization read is complete:

Choose **Next** to select the centers of the four corner wells (refer to Section 5.6.4, [Selecting the Centers of the Four Corner Wells](#)).

OR

Choose **Cancel** to close Optimizing Labware without performing the optimization.

5.6.4 Selecting the Centers of the Four Corner Wells

Use **Select Center** to precisely define the centers of the corner wells read in the optimization (Figure 5-10). **Select Center** displays an image of the well generated by the optimization read. Well centers are defined graphically by dragging cross hairs to the position visually identified as the center. **Select Center** is performed for each corner well individually.

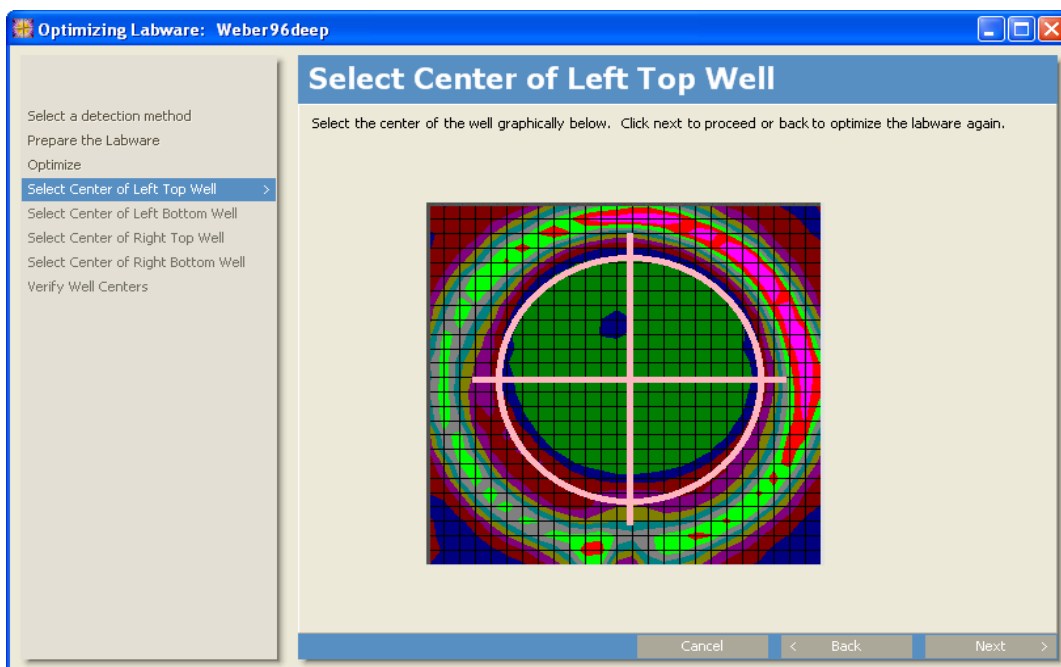


Figure 5-10. Selecting the well center

To define the centers of the wells:

1. Place the cursor in the well image, then click and drag the cross hairs to the desired center of the well.
2. Choose **Next** to define the center of the next well read. When all four well centers are defined, **Verify Well Centers** appears (refer to Section 5.6.5, [Verifying Well Centers](#)).

OR

Choose **Cancel** to close **Optimizing Labware** without completing the optimization.

5.6.5 Verifying Well Centers

Use Verify Well Centers to verify that the x and y offsets and distances between rows and columns are correct (Figure 5-11). If desired, the offsets, distances, and lot name may be edited in Verify Well Centers.

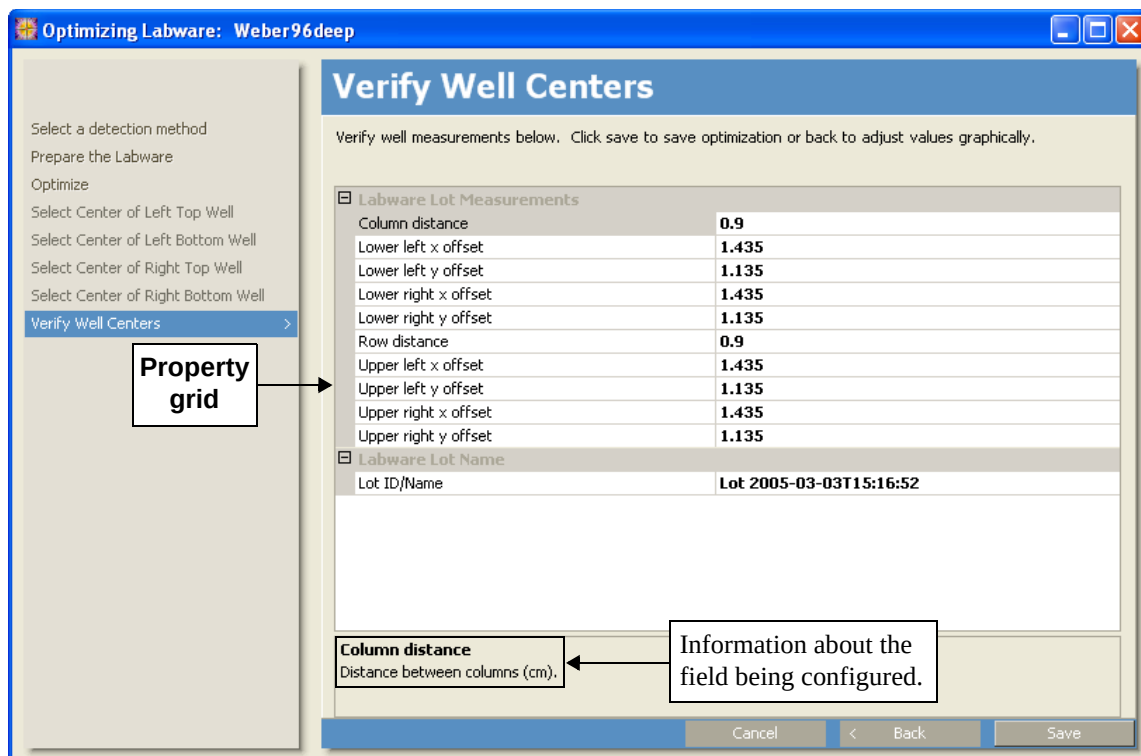


Figure 5-11. Verifying well centers

To verify and edit offsets, distances, and lot name:

1. If necessary, click the **+** next to Labware Lot Measurements to display the fields in the category.

Note: More information about the field being defined is displayed below the property grid (Figure 5-11).

2. In Column distance, verify the distance between columns and edit the dimension. *All* offsets and well dimensions are entered in centimeters, if desired.
3. Verify the x and y offsets for the lower two wells and edit the dimensions, if desired.
4. In Row distance, verify the distance between rows and edit the dimension, if desired.
5. Verify the x and y offsets for the upper two wells and edit the dimensions, if desired.
6. If necessary, click the **+** next to Labware Lot Name to display the default name assigned to the new labware lot.
7. Enter a new **Lot ID/Name**, if desired.

8. Choose **Save** to save the optimization data and create the new labware lot.

Note: To use the optimized lot in a measurement protocol, open the labware for editing and select the new **Labware Lot** (refer to Section 5.3.2, [Selecting and Editing Labware Lots](#)).

OR

Choose **Back** to redefine well centers graphically (refer to Section 5.6.4, [Selecting the Centers of the Four Corner Wells](#)).

OR

Choose **Cancel** to close Optimizing Labware without completing the optimization.

5.7 Exporting and Importing Labware

User-defined labware can be exported to an XML file and imported later to restore that configuration or share it with a copy of Concert - TRIAD Series Software installed on another system.

Default labware installed with Concert - TRIAD Series Software is present on all systems and may not be edited, deleted, or overwritten. For this reason, importing default labware from an XML export file is not permitted.

Note: When Signet is enabled, signed labware may be exported for use on another system; however, electronic signatures are not retained, which allows labware to be edited when imported to another system. Because signed labware may not be deleted or overwritten, importing signed labware into the system from which it was originally exported is not permitted.

To export labware:

1. In the Labware Selection List, select the labware to export.
2. From the File menu, choose **Export>Labware**. Browse for Folder appears (Figure 5-12).

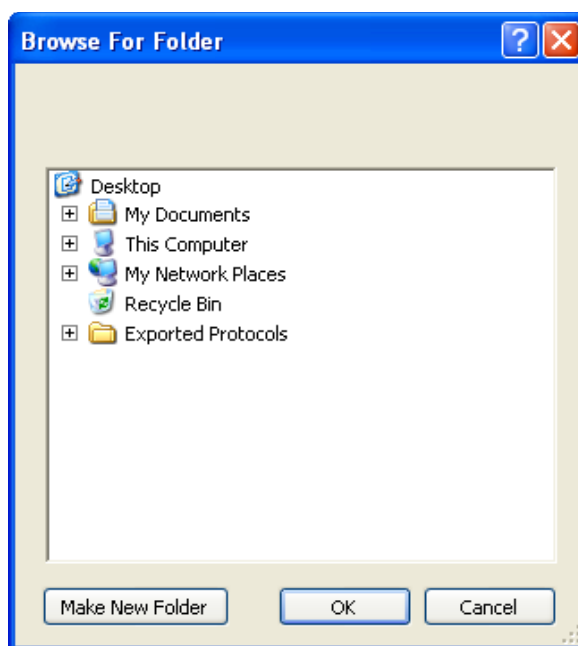


Figure 5-12. Choosing the folder where exported labware will be saved

3. In Browse for Folder, browse to the folder where the exported labware will be saved.

OR

Choose **Make New Folder** to create a new folder where the exported labware will be saved.

4. Choose **OK** to export the labware. The exported labware is saved using the default file name format, **Labware__LabwareName.xml**. In order to import the file at a later date, the filename must not be changed.

OR

Choose **Cancel** to stop the operation without exporting labware.

To import labware from an exported XML file:

1. From the **File** menu, choose **Import>Labware**. **Open** appears.
2. In **Open**, browse to and select the desired XML file to import.
3. Choose **Open**. The labware is imported to the Labware Selection List.



Creating Protocols

6.1 Overview

A protocol stores all parameters required to perform a measurement, including technique type, detection method(s), labware type, and preparation methods, such as shaking. Multiple measurements, including kinetic and scan measurements, may be configured in a single protocol. Protocols also specify how measurement results are viewed, exported, or printed when a protocol run completes.

The Concert - TRIAD Series Analysis Software module may be purchased separately to add advanced evaluation and analysis capabilities to the software. This chapter includes instructions for configuring the analysis features provided by the module.

Note: Always verify the parameters configured in a protocol. Failing to verify all configured parameters may result in incorrect measurement results.

Protocols are listed in the Protocol Selection List (Figure 6-1), which provides access to all protocol actions:

- [Creating Basic and Analysis Protocols](#) (Section 6.2).
- [Running Protocols](#) (Section 6.3).
- [Editing Protocols](#) (Section 6.4).
- [Copying Protocols](#) (Section 6.5).
- [Deleting Protocols](#) (Section 6.6).
- [Printing Protocol Configuration Information](#) (Section 6.7).
- [Exporting and Importing Protocols](#) (Section 6.8).

To select protocols and access protocol functions:

From the navigation pane, choose **Protocols**. The Protocol Selection List appears (Figure 6-1).

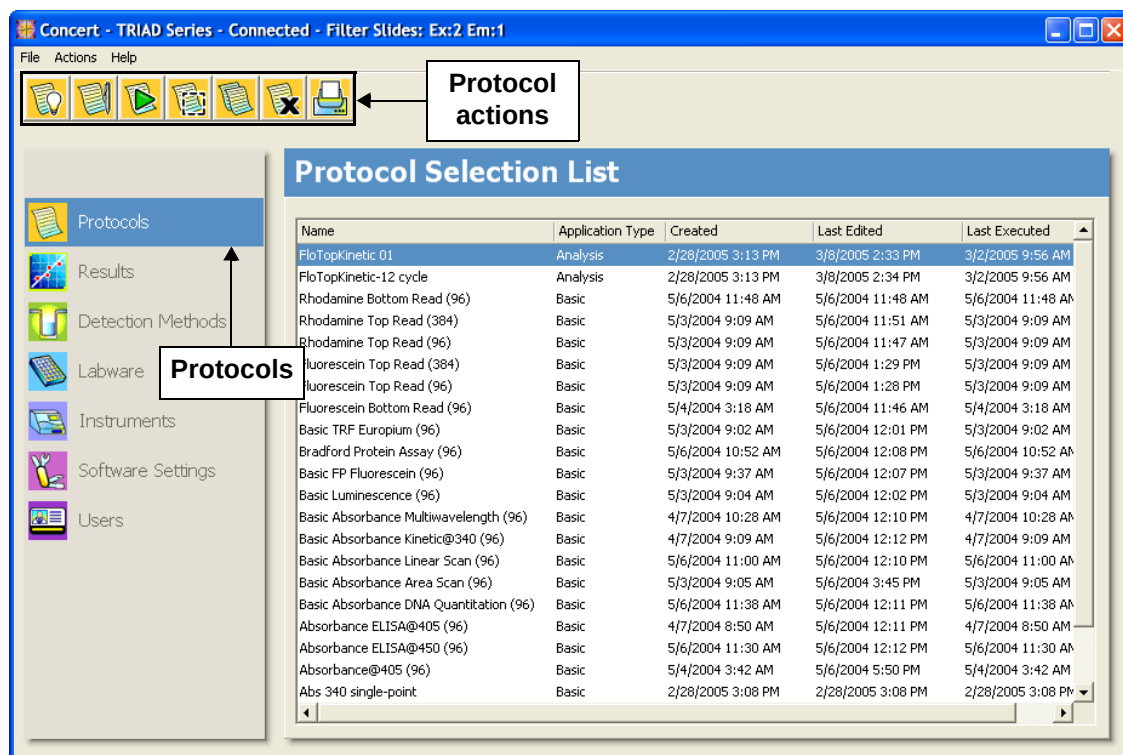


Figure 6-1. Protocol Selection List

6.2 Creating Basic and Analysis Protocols

New protocols are defined in Create Protocol, which guides the creation process with a wizard-type interface. Creating a new protocol requires:

- [*Configuring General Settings*](#) (Section 6.2.1).
- [*Selecting the Technique Type*](#) (Section 6.2.2).
- [*Selecting the Labware Type Used in the Protocol*](#) (Section 6.2.3).
- [*Configuring Labware Layout Settings*](#) (Section 6.2.4).
- [*Configuring Detection and Preparation Methods*](#) (Section 6.2.5).
- [*Configuring Output Settings*](#) (Section 6.2.11).

When the optional Concert - TRIAD Series Analysis Software module is installed, several analysis options may be selected and configured to transform measurement data as desired:

- [*Configuring Variables \(Concert - TRIAD Series Analysis Software only\)*](#) (Section 6.2.6).
- [*Configuring a Transformation Formula \(Concert - TRIAD Series Analysis Software only\)*](#) (Section 6.2.7).
- [*Configuring Concentration \(Concert - TRIAD Series Analysis Software only\)*](#) (Section 6.2.8).
- [*Configuring Cutoff Values \(Concert - TRIAD Series Analysis Software only\)*](#) (Section 6.2.9).
- [*Configuring Validation Rules \(Concert - TRIAD Series Analysis Software only\)*](#) (Section 6.2.10).

To create and configure a new protocol:



1. From the toolbar, choose **Create a new protocol**. Select Application Type appears (Figure 6-2).

OR

From the Actions menu, choose **Create a new protocol**.

OR

Right-click in the Protocol Selection List and choose **Create a new protocol** from the menu.

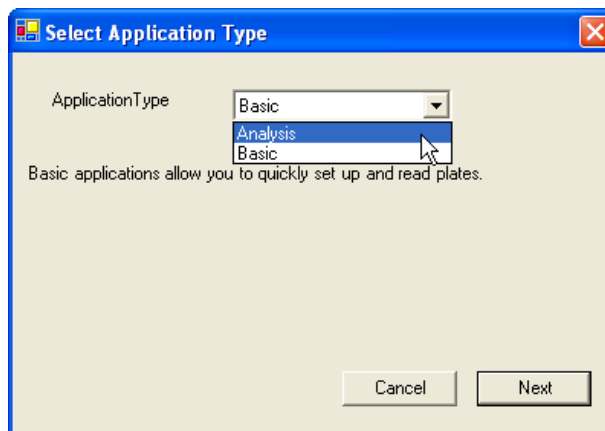


Figure 6-2. Selecting the application type

2. Choose the **Application Type**. The types available in the pull-down menu depend on which optional modules have been installed on the system. This chapter covers configuring:
 - **Basic** — default application type. Basic protocols may be quickly configured to perform a complex sequence of measurements in a protocol run, but do not provide the ability to transform and analyze measurement data based on parameters configured in the protocol.
 - **Analysis** — available only when the optional Concert - TRIAD Series Analysis Software module is installed. Analysis applications allow measurement data to be transformed and analyzed using formulas, variables, and parameters configured in the protocol.
3. Choose **Next** to configure the protocol. **Create Protocol** appears, displaying General Settings (refer to Section 6.2.1, [Configuring General Settings](#)).

6.2.1 Configuring General Settings

Use General Settings to define the protocol name and enter any related notes about the protocol (Figure 6-3). When the optional Concert - TRIAD Series Analysis Software module is installed, Analysis Options to include in the protocol are available for selection.

The screenshot shows the 'Create Protocol Kinetic 340' dialog box with the 'General Settings' tab selected. The left sidebar contains a tree view with the following items: General Settings (selected), Technique Type, Labware Selection, Layout Settings, Method Selection, Variables, Transformation, Concentration, Cutoff, Validation, and Output Settings. The main area is titled 'General Settings' and contains the following fields:

- Protocol name: Kinetic 340
- Date created: Monday, March 07, 2005
- Date edited: Monday, March 07, 2005
- Date last run: Monday, March 07, 2005
- Notes: A large text area for entering notes.

Below the Notes field is the 'Analysis Options' section, which is expanded and shows the following checked options:

- ☒ Variables
- ☒ Transformation
- ☒ Concentration
- ☒ Cutoff
- ☒ Validation

At the bottom of the dialog are 'Cancel' and 'Next >' buttons. A callout box with the title 'Analysis Options' and the text 'Available only when an Analysis application type is being configured.' points to the Analysis Options section.

Figure 6-3. Defining a protocol name and entering notes about the protocol

To configure the general settings for a new protocol:

1. In Protocol name, enter a unique name for the protocol.
2. In Notes, enter a description for the protocol, if desired.

3. If configuring an Analysis application, select the desired Analysis Options to be configured in the protocol:

- **Variables** — define up to ten numeric values that may be used in any formula configured in the protocol (refer to Section 6.2.6, [Configuring Variables \(Concert - TRIAD Series Analysis Software only\)](#)).
- **Transformation** — configure an algebraic formula to transform measurement data (refer to Section 6.2.7, [Configuring a Transformation Formula \(Concert - TRIAD Series Analysis Software only\)](#)).
- **Concentration** — choose a curve fitting method and configure response formulas (refer to Section 6.2.8, [Configuring Concentration \(Concert - TRIAD Series Analysis Software only\)](#)).
- **Cutoff** — configure cutoff formulas to classify measured samples according to defined cutoff values (refer to Section 6.2.9, [Configuring Cutoff Values \(Concert - TRIAD Series Analysis Software only\)](#)).
- **Validation** — configure up to ten validation formulas to evaluate if a protocol run meets the specified conditions required to be valid. (refer to Section 6.2.10, [Configuring Validation Rules \(Concert - TRIAD Series Analysis Software only\)](#)).

Note: Only Analysis Options that have been selected appear in the Create Protocol navigation pane and are available for configuration in the protocol.

6.2.2 Selecting the Technique Type

Use Technique Type to select the measurement technique performed by the protocol (Figure 6-4). Only techniques supported by the instrument and for which detection methods have already been defined are available. For more information about technique types, refer to Chapter 4, [Creating and Editing Detection Methods](#).

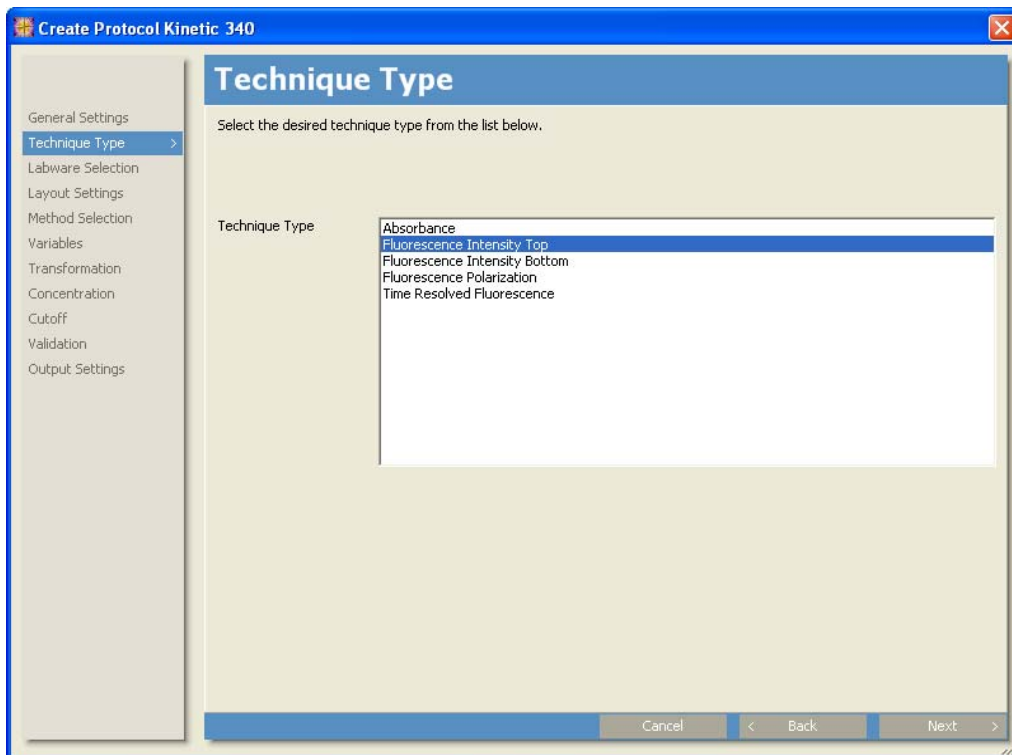


Figure 6-4. Selecting the measurement technique for a TRIAD

To select a technique type:

In **Technique Type**, choose the desired technique.

Note: If editing an existing protocol, selecting a different technique type deletes any detection methods previously configured in **Method Selection**. New detection methods must be configured before the protocol may be used to perform measurements (refer to Section 6.2.5, [Configuring Detection and Preparation Methods](#)).

6.2.3 Selecting the Labware Type Used in the Protocol

Use Labware Selection to select the type of labware used in the protocol (Figure 6-5). Labware must be configured prior to configuring the protocol. Only labware configured for the selected technique type is available. Labware cannot be edited once it is used in a protocol. Refer to Chapter 5, [Creating and Editing Labware](#), for detailed information about creating and configuring labware.

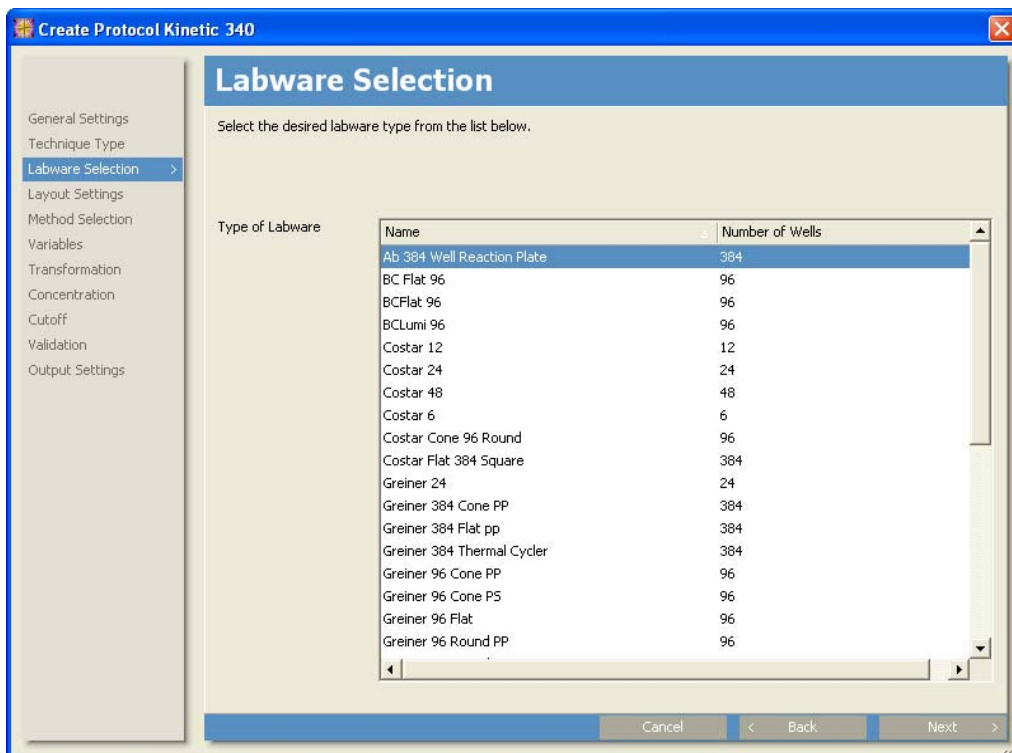


Figure 6-5. Selecting the type of labware used in the protocol

To select labware:

Select the desired **Type of Labware** from the list.

6.2.4 Configuring Labware Layout Settings

Use Layout Settings to configure how wells on the plate are read (Figure 6-6). Settings are configured in two tabs:

- **Layout Selection Settings** — configures which wells are read in the measurement. Refer to Section 6.2.4.1, [Configuring the Sample Layout for Basic Applications](#), or Section 6.2.4.2, [Configuring the Sample Layout for Analysis Applications](#) depending on the type of application being configured.
- **Reading Direction Settings** — configures the order of how wells are read: row-by-row, column-by-column, or well-by-well (refer to Section 6.2.4.3, [Configuring Reading Direction](#)).

6.2.4.1 Configuring the Sample Layout for Basic Applications

In Basic applications, use Layout Selection Settings to configure the location of sample wells on the plate.

Note: Basic applications support sample wells only. The optional Concert - TRIAD Series Analysis Software module supports configuring other well types, such as blanks, controls, and standards.

To configure labware layout settings:

1. In Layout Settings, choose the **Layout Selection Settings** tab to view the layout of the selected labware (Figure 6-6).

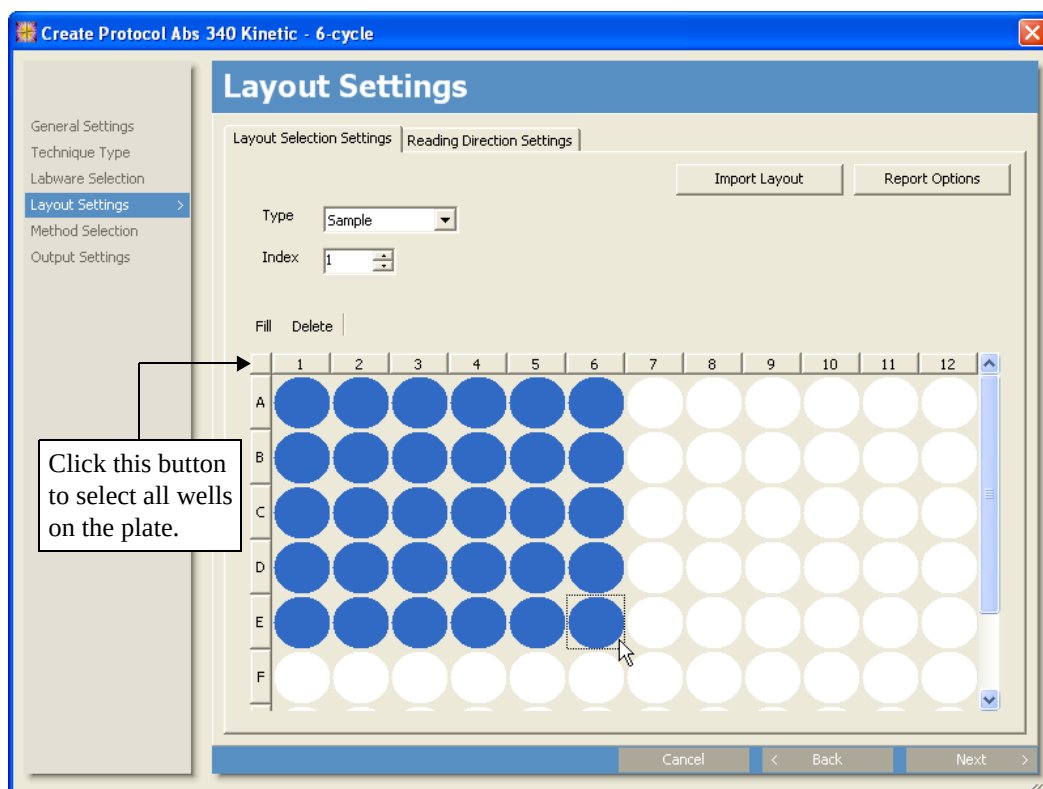


Figure 6-6. Configuring Layout Settings for a Basic application

2. To import a plate layout from an existing protocol, choose **Import Layout** and select the desired protocol from the list that appears. Only protocols with compatible labware and application types are listed.

OR

To create a new or edit an existing plate layout, select the desired wells to label. To select:

- **all wells on the plate** — click the small button in the upper left corner of the plate layout display (Figure 6-6).
 - **all wells in a single column or row** — click the desired column or row header. Multiple columns or rows may be selected by holding down the **CTRL** key while selecting each header desired.
 - **individual wells** — click on the desired well. Multiple wells may be selected by holding down the **CTRL** key while clicking on each well desired.
 - **groups of wells** — click and drag over the desired group of wells. Multiple groups may be selected by holding down the **CTRL** key while dragging over each desired group.
3. In **Index**, choose the initial label number for the sequence of selected wells.
 4. Choose **Fill** to label the selected wells.
- OR
- Choose **Delete** to delete existing labels from the selected wells.
5. Repeat steps 2 – 4 to define additional well selections, if desired.
 6. Choose **Report Options** and select plate layout options for printouts:
 - **Print in Matrix** — well label identifiers appear arranged in a matrix corresponding to the plate layout.
 - **Print in List** — well label identifiers appear in a list.

6.2.4.2 Configuring the Sample Layout for Analysis Applications

In Analysis applications, use Layout Selection Settings to configure well types and locations, replicates, and the layout of well identifiers on the plate.

Note: Analysis applications may be configured only when the optional Concert - TRIAD Series Analysis Software module is installed on the system.

To configure labware layout settings:

1. In Layout Settings, choose the **Layout Selection Settings** tab to view the layout of the selected labware (Figure 6-7).

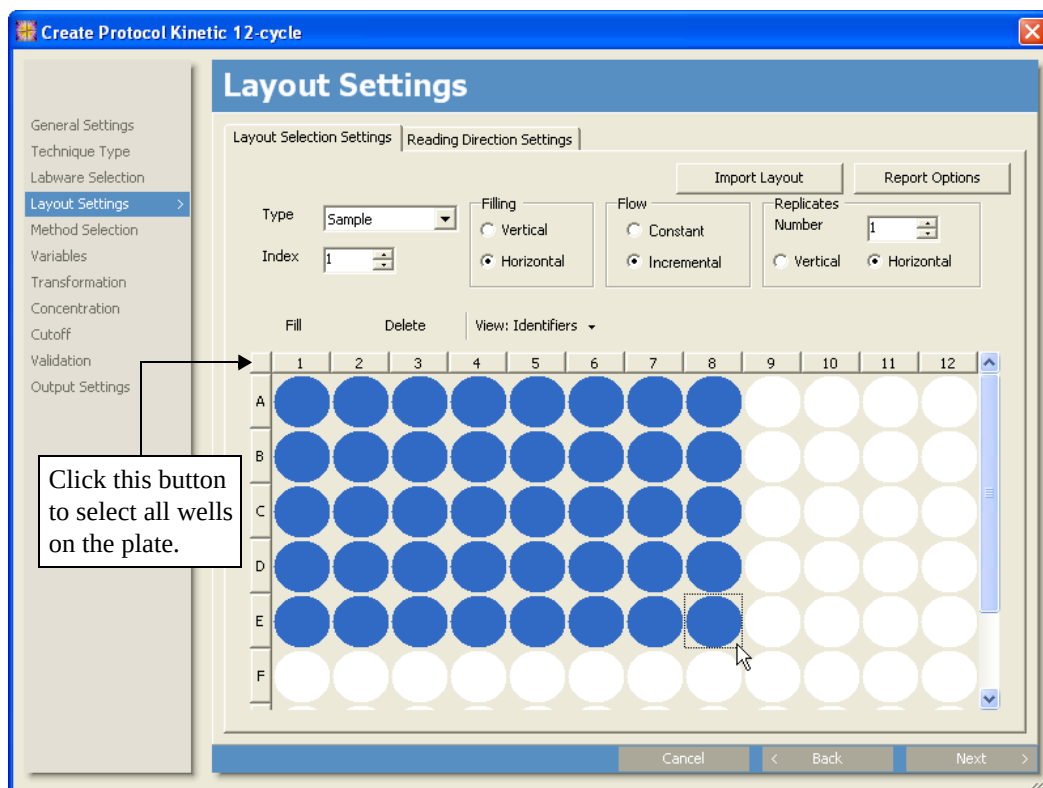


Figure 6-7. Configuring Layout Settings for an Analysis application

2. To import a plate layout from an existing protocol, choose **Import Layout** and select the desired protocol from the list that appears. Only protocols with compatible plate layouts are listed.

OR

To create a new or edit an existing plate layout, select the desired wells to label. To select:

- **all wells on the plate** — click the small button in the upper left corner of the plate layout display (Figure 6-7).
 - **all wells in a single column or row** — click the desired column or row header. Multiple columns or rows may be selected by holding down the **CTRL** key while selecting each header desired.
 - **individual wells** — click on the desired well. Multiple wells may be selected by holding down the **CTRL** key while clicking on each well desired.
 - **groups of wells** — click and drag over the desired group of wells. Multiple groups may be selected by holding down the **CTRL** key while dragging over each desired group.
3. Choose the **Type** of wells to add to the plate layout:
 - **Standard** — a well with a known concentration used to develop or correct a standard curve. Up to twelve standards may be configured on a plate.
 - **Control** — a well with a known, expected signal used to verify the results of the plate.
 - **Positive Control** — a control well in which a known amount of target reagent generates a signal to verify positive results measured in sample wells.
 - **Negative Control** — a control well lacking the target reagent that generates little to no signal; verifies negative results measured in sample wells.
 - **Sample** — a well containing a sample to measure.
 - **Blank** — a well filled with reagents but no reacting sample. Blank wells are used to measure background noise. When blanks are configured, background correction is automatically applied to measurement results.
 - **Empty** — a well that is left empty.
 4. If configuring Blank wells, select the type of Blank Validity desired: **Plate**, **Row**, or **Column**. The mean value of all blank wells in the selected validity option is subtracted from sample wells to provide background correction.

Note: Blank Validity replaces Filling, Flow, and Replicate options in Layout Settings when configuring Blank wells.

5. In **Index**, choose the initial label number for the sequence of selected wells.

6. In **Filling**, choose the desired direction for labeling the selected wells:
 - **Vertical** — labels wells column by column.
 - **Horizontal** — labels wells row by row.
7. In **Flow**, choose how the index is applied to wells in the selection.
 - **Constant** — all well identifiers in the selection are assigned the current index number.
 - **Incremental** — increases each well identifier in the selection by one.
8. In **Replicates**, select the number of replicates for each sample and the layout orientation on the plate:
 - **Vertical** — replicates are arranged vertically in columns.
 - **Horizontal** — replicates are arranged horizontally in rows.

Note: Replicate parameters are available for configuration only when Incremental Flow is selected.

9. Choose **Fill** to label the selected wells.

OR

Choose **Delete** to delete existing labels from the selected wells.

10. Repeat steps 2 – 9 to define additional well selections, if desired.
11. Choose **Report Options** and select which information about plate layouts appears in printed reports.
 - **CV** — the coefficient of variation of a replicate group. Available only when replicates are configured in the layout.
 - **Print in Matrix** — well label identifiers appear arranged in a matrix corresponding to the plate layout.
 - **Print in List** — well label identifiers appear in a list.
 - **Standard Deviation** — the measure of dispersion from the mean value of a replicate group. Available only when replicates are configured in the layout.

6.2.4.3 Configuring Reading Direction

In a protocol run, wells may be read row-by-row, column-by-column, or individually, one at a time.

To select how wells are read:

1. Choose the **Reading Direction Settings** tab to configure the order in which wells are read in the protocol (Figure 6-8).

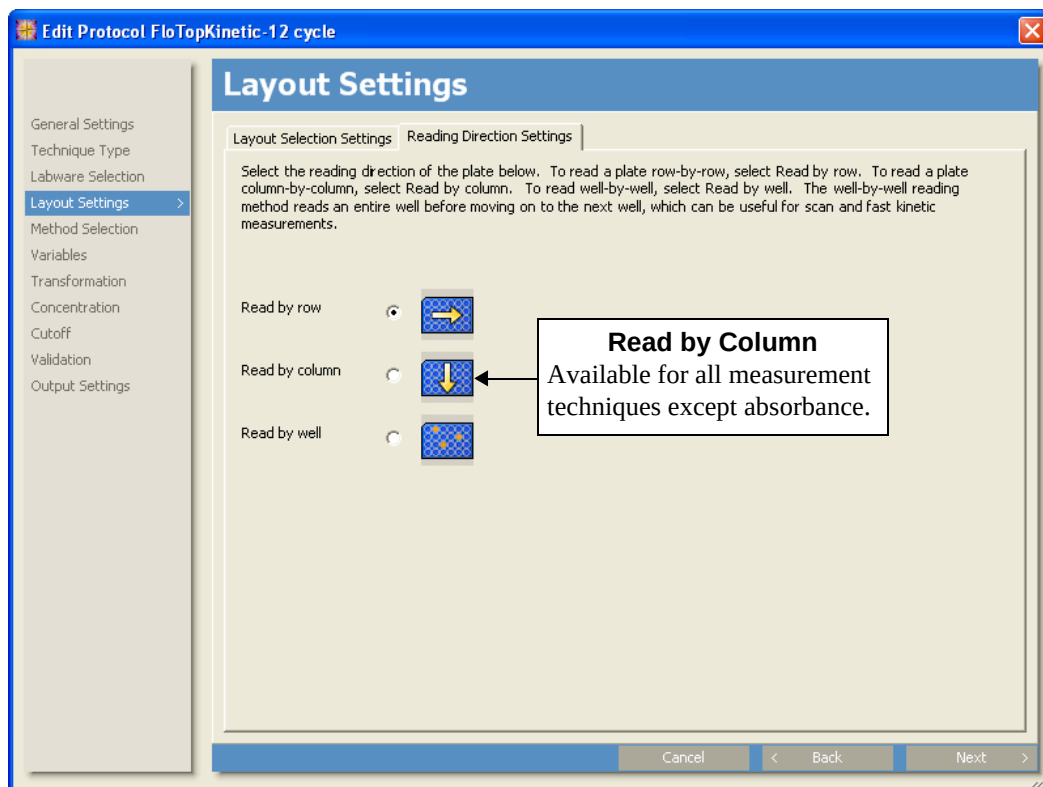


Figure 6-8. Selecting how wells on the plate are read

2. Select the desired reading direction:
 - **Read by row** — reads plates row-by-row.
 - **Read by column** — reads plates column-by-column. Available for all measurement techniques except absorbance.
 - **Read by well** — reads each well individually before reading the next well, which is useful for kinetic and scan measurements.

6.2.5 Configuring Detection and Preparation Methods

Use Method Selection to select and configure detection and preparation methods (Figure 6-9). Two configuration modes are available:

- **Basic** — Select to configure protocols requiring a single detection method only. Single point, kinetic, and scan measurement types are supported. Microplate shaking may be configured, if desired (refer to Section 6.2.5.1, [Configuring a Method in Basic Mode](#)).
- **Advanced** — Select to configure protocols requiring multiple detection methods, such as a multiwavelength absorbance measurement. Detection methods and preparation methods, such as microplate shaking, are arranged as desired in a linear execution sequence (refer to Section 6.2.5.2, [Configuring a Method in Advanced Mode](#)).

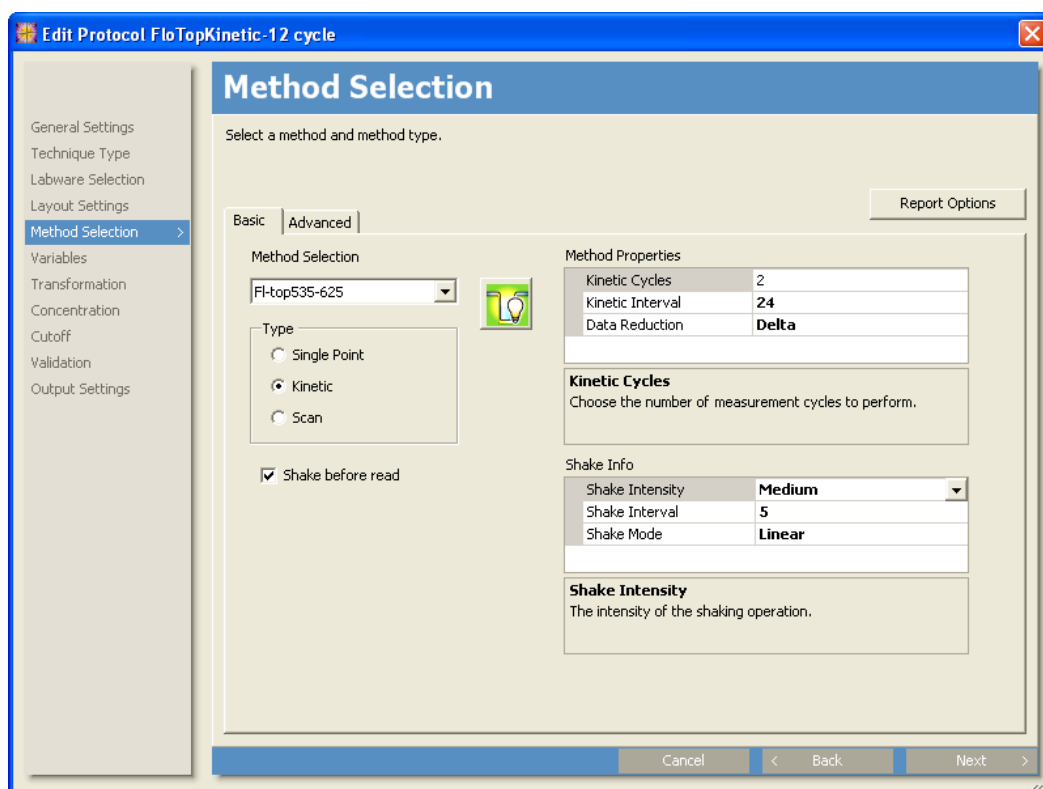


Figure 6-9. Configuring a detection method in Method Selection

6.2.5.1 Configuring a Method in Basic Mode

Configuring a method in basic mode includes selecting a detection method and configuring properties for a kinetic or scan measurement and shaking, if desired.

To select and configure a method in basic mode:

1. In Method Selection, choose the **Basic** tab to toggle from advanced mode, if necessary. Basic mode configuration parameters appear (Figure 6-10). Refer to Section 6.2.5.2, [Configuring a Method in Advanced Mode](#), to configure a method with multiple detection and/or preparation methods.

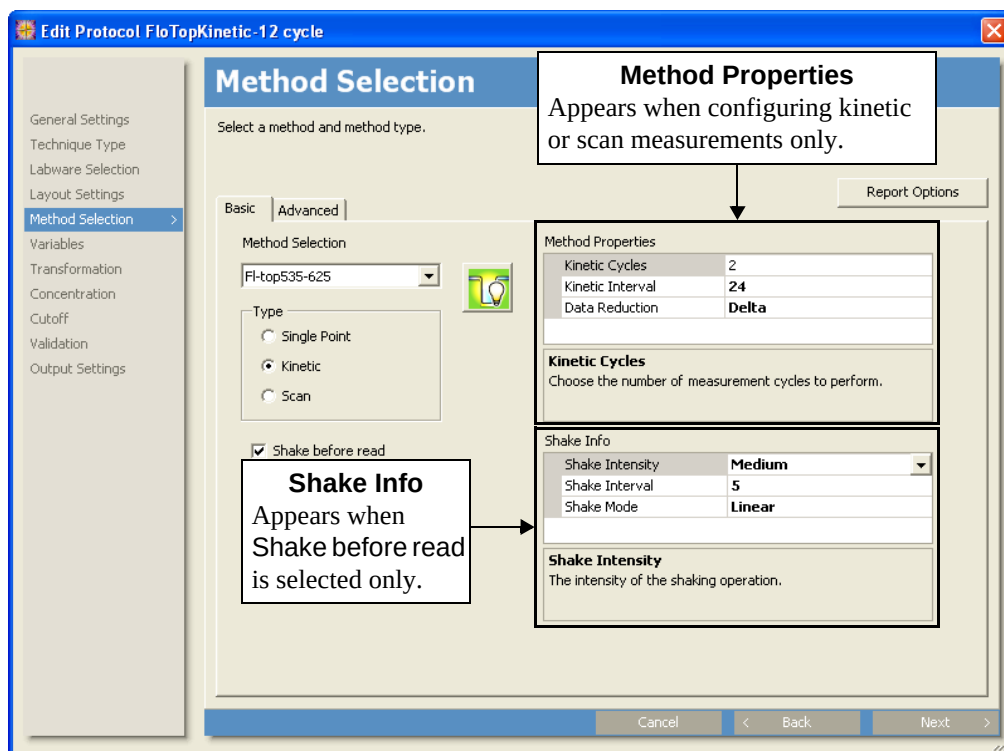


Figure 6-10. Configuring a method in basic mode

2. In Method Selection, select the detection method for use in the protocol. Only detection methods of the technique selected for the protocol are available (refer to Section 6.2.2, [Selecting the Technique Type](#)).

OR

Choose **Create a new detection method** to create a new method using the technique type currently selected in the protocol. Refer to Chapter 4, [Creating and Editing Detection Methods](#), for more information about creating detection methods.

3. Select the measurement Type:

- **Single Point** — perform a single measurement on each sample. Single point measurements do not require configuring Method Properties.
- **Kinetic** — perform a specified series of measurements on each sample at specified intervals. Kinetic Method Properties appear.
- **Scan** — perform an area or linear scan on each sample. Scan Method Properties appear.

Note: Scan measurements may be configured for absorbance and fluorescence intensity measurements only.

4. For kinetic or scan measurements, configure Method Properties. Refer to Section 6.2.5.1.1, [Configuring a Kinetic Method](#), or Section 6.2.5.1.2, [Configuring a Scan Method](#), for more information.5. Choose **Report Options** and select the method information and measurement results data included in printouts:

- **Reduced Data** — results calculated using the selected data reduction method. Available for kinetic and scan measurement only.
- **Method Information** — details about the configured method, including technique type and filter(s) used.
- **Print in Matrix** — results appear arranged in a matrix corresponding to the plate layout. Available for single point measurements only.
- **Graph** — kinetic or scan graphs of results for all measured samples. Available for kinetic and scan measurements only.
- **Raw Data** — results from each kinetic cycle or scan point. Available for kinetic and scan measurements only.
- **Print Status** — status indicating whether or not the well was read successfully.

6. Select **Shake before read** to shake the microplate before the performing measurements in a protocol run. In kinetic measurements, the plate is shaken for the specified intensity and interval before each measurement cycle. Shake Info appears (Figure 6-10).

CAUTION: Shake low density plates, such as 6- or 48-well plates, at low speed only. Shaking low density plates at higher speeds may cause liquid in wells to spill.

7. In Shake Info, select the desired Shake Intensity: **Low**, **Medium**, or **High**.8. Enter the desired **Shake Interval** in seconds (1–60).

9. Select the desired Shake Mode:

- **Linear** — shakes from side to side.
- **Orbital** — shakes labware in a circular pattern.
- **Squared** — shakes labware in a square pattern, moving at right angles.

10. When the detection method is configured as desired, choose **Next** to configure how measurement results are saved and/or printed (refer to Section 6.2.11, [Configuring Output Settings](#)).

OR

Choose **Back** to configure the plate layout (refer to Section 6.2.4, [Configuring Labware Layout Settings](#)).

OR

Choose **Cancel** to close Create Protocol without saving the new protocol.

6.2.5.1.1 Configuring a Kinetic Method

Kinetic measurements perform a specified series of measurements on each sample at specified intervals. Final measurement results are calculated from raw data using a data reduction method.

- **TRIAD** — Kinetic measurements may be configured for all method types except fluorescence polarization.

To configure a kinetic measurement:

1. In **Type**, select **Kinetic**. **Method Properties** appears (Figure 6-10).
2. In **Method Properties**, enter the number of **Kinetic Cycles** to be performed. Kinetic measurements may be set to perform 2 to 100 cycles.
3. In **Method Properties**, enter the desired **Kinetic Interval** in seconds. The interval is the length of time between each measurement of the same well.

Note: The minimum kinetic interval is populated automatically in **Kinetic Interval**, and is determined by the labware type and layout settings configured in the protocol. The maximum interval between measurement cycles is 65,535 seconds.



4. In **Method Properties**, choose the browse button to select and configure a **Data Reduction** method. Data reduction calculates a single value for each sample from measurement data collected during each cycle in a protocol run. **Data Reduction Method** appears (Figure 6-11).

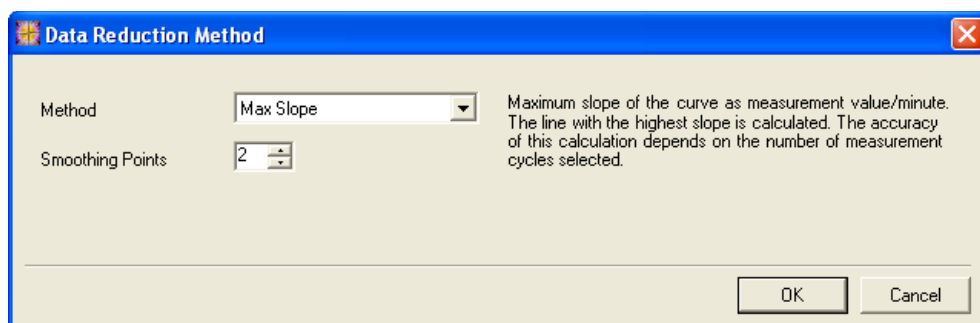


Figure 6-11. Selecting a data reduction method for a kinetic measurement

5. In **Data Reduction Method**, select the desired **Method**. If required by the selected method, additional parameters, such as smoothing points, appear.

6. Configure additional parameters for the selected data reduction method, if required.

Note: Refer to Table A-2 in [Appendix A: Data Reduction Techniques](#) for details about the data reduction methods available for kinetic measurements.

7. Choose **OK** to confirm the selection of the data reduction method.

6.2.5.1.2 Configuring a Scan Method

Area and linear scan measurements may be configured for absorbance and fluorescence intensity methods. Area scans read a number of measurement points arranged in a grid pattern across each well. Linear scans read a number of points in a linear axis crossing the center of each well.

Note: Scan measurements may be configured in protocols configured to use plates with 96 or fewer wells only.

To configure an area or linear scan:

1. In Type, select **Scan**. Method Properties appears.
2. To configure the type of scan measurement and the number of points measured, in Method Properties, click in **Scan Points** and choose the configuration button. Scan Selection Editor appears (Figure 6-12).

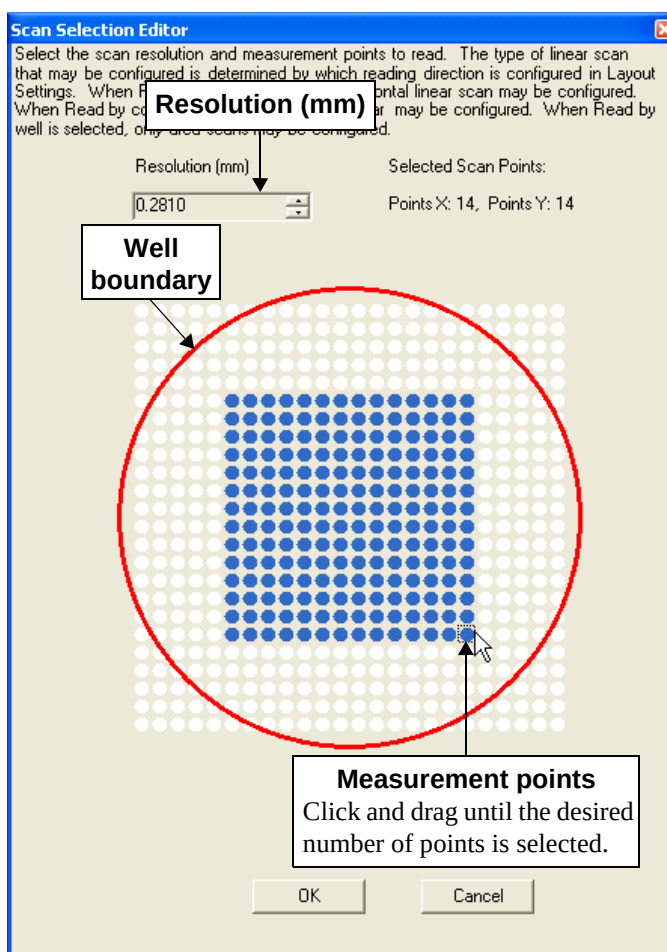


Figure 6-12. Configuring an area scan

3. In Resolution (mm), use the up and down arrows to choose the proximity of measurement points. Choosing a smaller value increases the number of measurement points available; choosing a larger value decreases the number of points available. Available resolutions are determined by the type of labware

selected for use in the protocol. Refer to Sections 6.2.3, [Selecting the Labware Type Used in the Protocol](#) and 6.2.4, [Configuring Labware Layout Settings](#), for more information.

4. To configure an area scan, click anywhere inside the well boundary, except the center row, and drag until the desired number of measurement points is selected (Figure 6-12).

OR

To configure a linear scan, click anywhere on the center row or column inside the well boundary and drag towards the boundary until the desired number of measurement points is selected (Figure 6-13).

Note: The type of scan that may be configured is determined by the Reading Direction Settings in Layout Settings (refer to Section 6.2.4, [Configuring Labware Layout Settings](#)). For example, horizontal linear scans along the center row may be configured only when Read by row is selected, while vertical linear scans along the center column may be configured only when Read by column is selected. Read by well allows area and vertical linear scans to be configured.

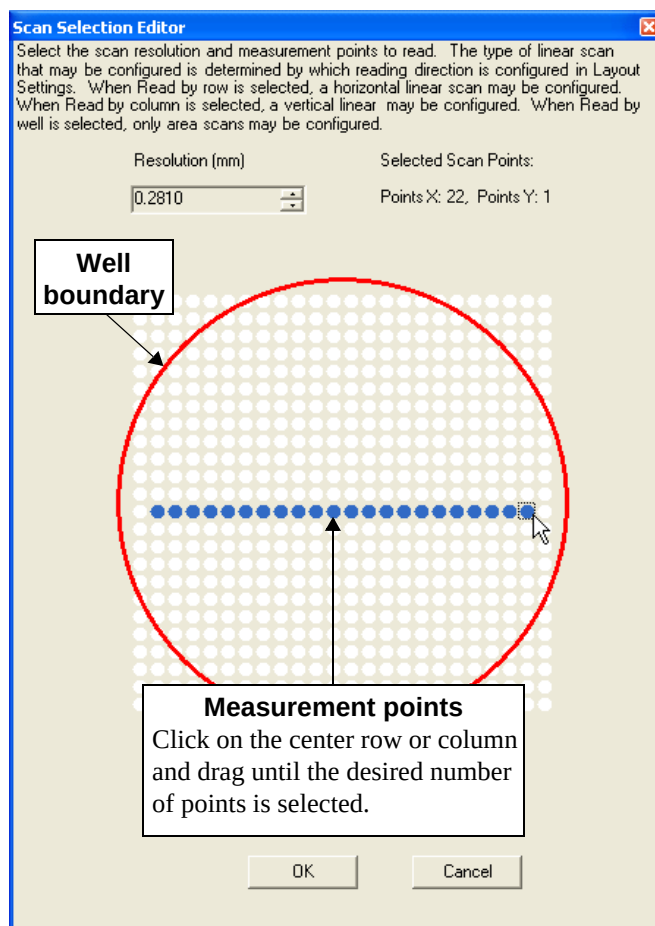


Figure 6-13. Configuring a linear scan

5. Choose **OK** to save the scan configuration and close the Scan Selection Editor.

OR

Choose **Cancel** to close the Scan Selection Editor without updating changes.



6. In Method Properties, click in **Data Reduction** and choose the configuration button. Data Reduction Method appears (Figure 6-14).

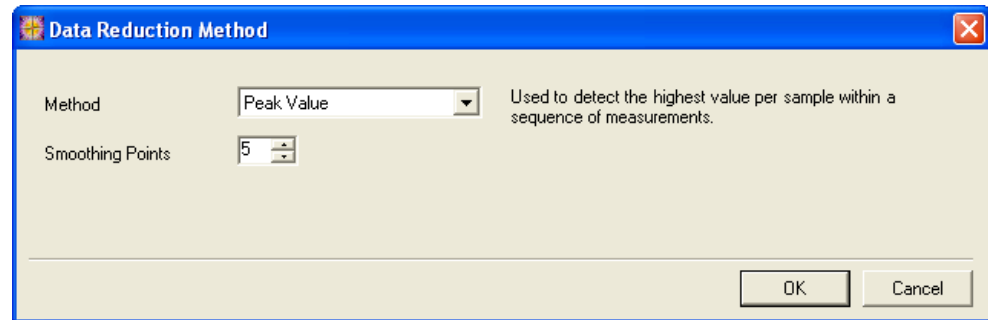


Figure 6-14. Selecting a data reduction method for a scan method

7. In Data Reduction Method, select the desired **Method**. If required by the selected method, additional parameters, such as smoothing points, appear.
8. Configure additional parameters for the selected data reduction method, if required.

Note: Refer to Table A-1 in [Appendix A: Data Reduction Techniques](#) for details about the data reduction methods available for scan measurements.

9. Choose **OK** to confirm the selection of the data reduction method.

6.2.5.2 Configuring a Method in Advanced Mode

Configuring a method in advanced mode allows multiple detection methods and preparation methods, such as microplate shaking and temperature control (TRIAD only), to be arranged as desired in a linear execution sequence. Kinetic and scan methods may also be configured.

Protocols that require multiple measurements at different wavelengths, such as a multiwavelength absorbance measurement, must be configured in advanced mode.

To select and configure a method in advanced mode:

1. In Method Selection, choose the **Advanced** tab to toggle from basic mode, if necessary. Advanced mode configuration parameters appear (Figure 6-15).

Note: Refer to Section 6.2.5.1, [Configuring a Method in Basic Mode](#), to configure a protocol requiring only a single detection method.

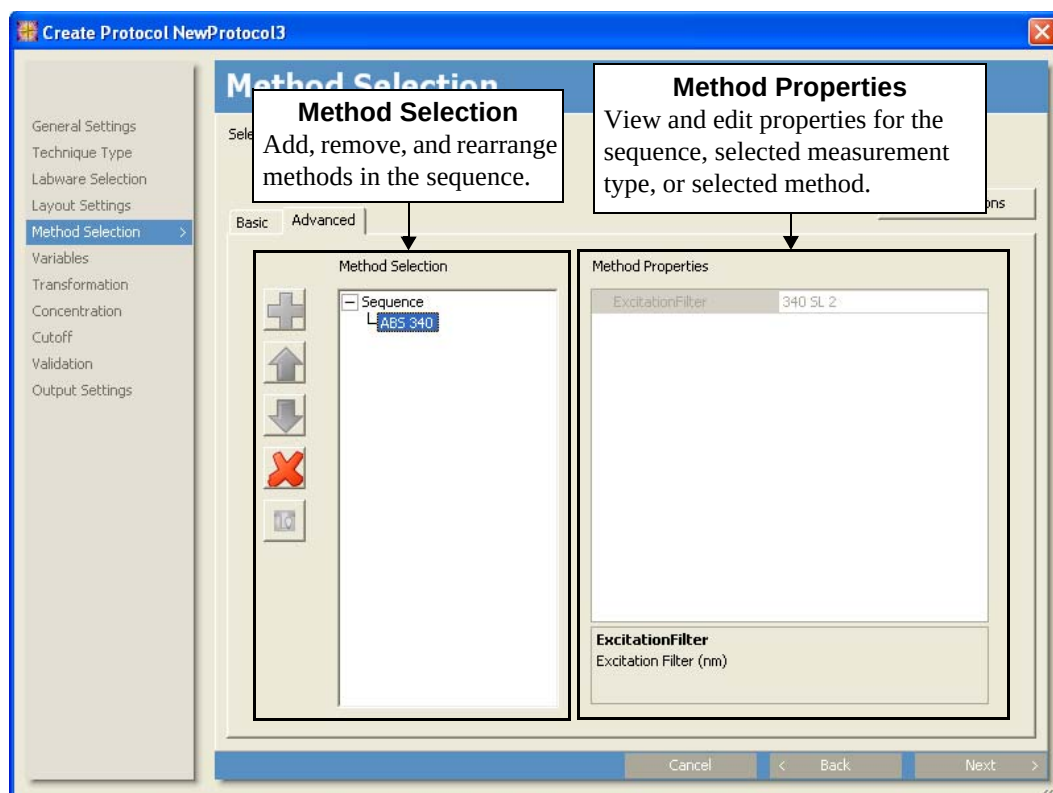


Figure 6-15. Configuring a method in advanced mode



- To add an existing detection method, choose **Add a method to this protocol**, select a measurement type — **Add Method** (single point), **Add Kinetic**, or **Add Scan** — and then select a detection method (Figure 6-16). Only detection methods compatible with the selected measurement and technique types are listed in the menu.

OR

Right-click in Method Selection, select a measurement type — **Add Method** (single point), **Add Kinetic**, or **Add Scan** — and then select a detection method.

OR

To create a new detection method to be added to the protocol, choose **New Method**. Refer to Chapter 4, [Creating and Editing Detection Methods](#), for detailed information about creating detection methods.

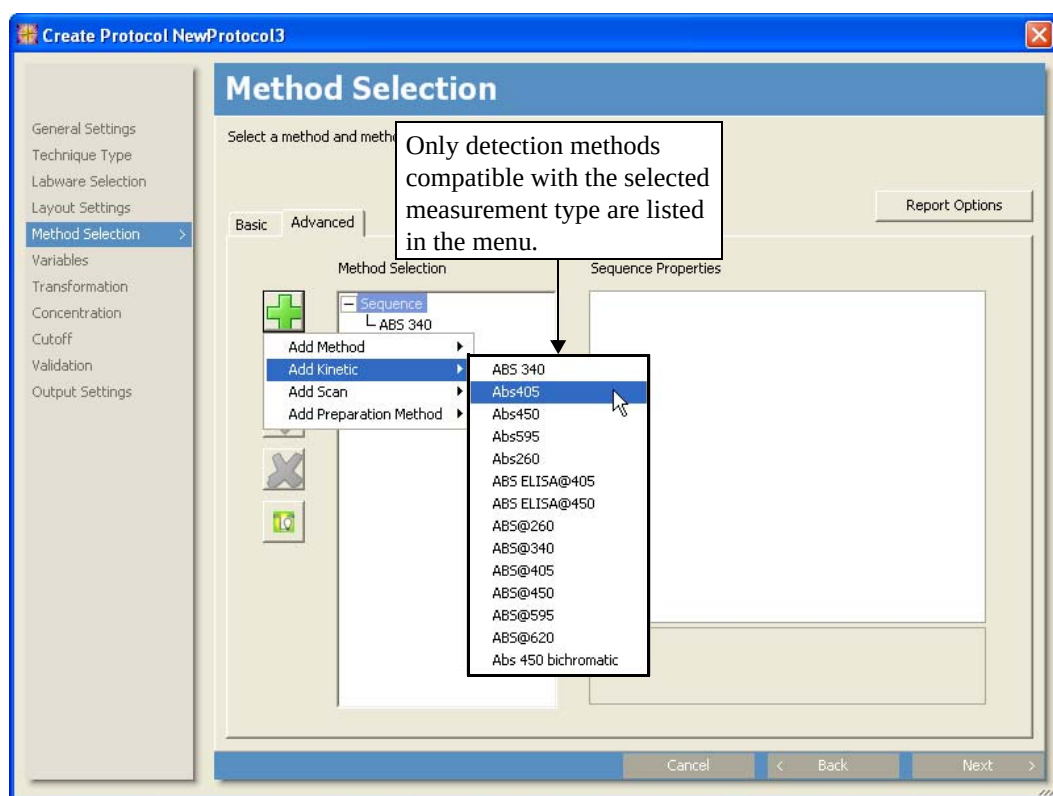


Figure 6-16. Adding a kinetic detection method

- If adding a kinetic detection method, in Method Selection, select **Kinetic** above the method being configured. Kinetic Properties replaces Method Properties in the right pane (Figure 6-17).

OR

If adding a scan detection method, in Method Selection, select **Scan** above the method being configured. Scan Properties replaces Method Properties in the right pane.

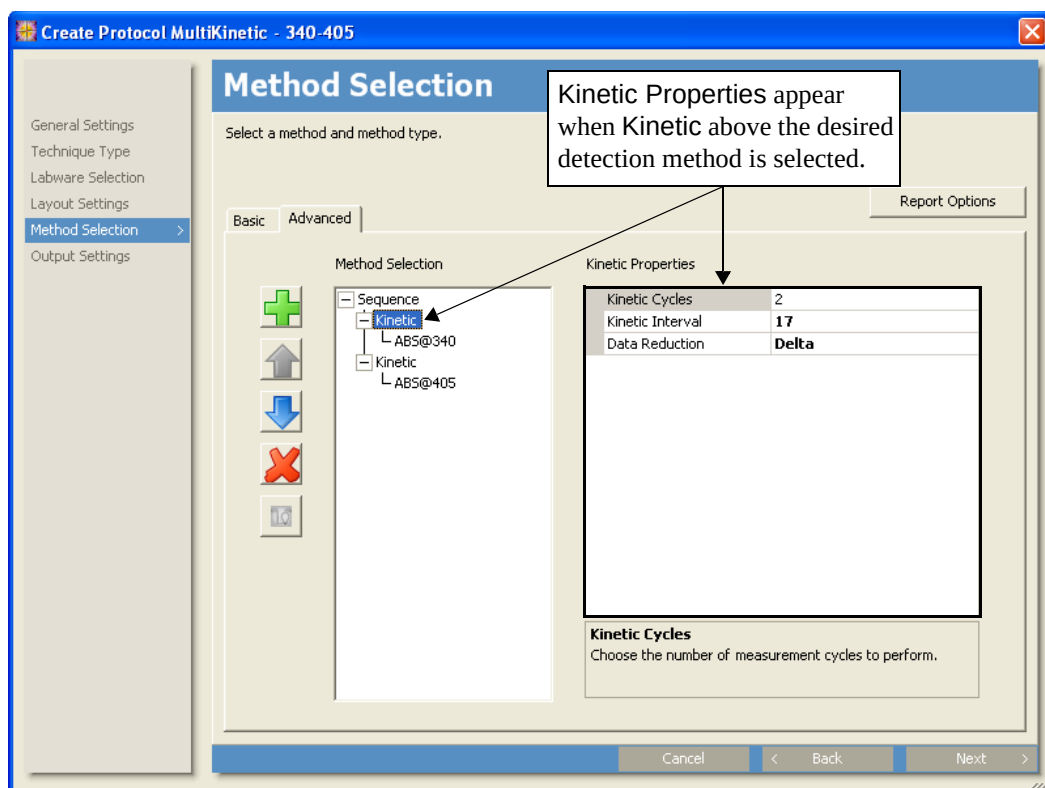


Figure 6-17. Configuring Loop Properties for a kinetic measurement

4. If configuring a kinetic measurement, configure **Kinetic Properties** by following the instructions in Section 6.2.5.1.1, [Configuring a Kinetic Method](#).

OR

If configuring a scan measurement, configure **Scan Properties** by following the instructions in 6.2.5.1.2, [Configuring a Scan Method](#).

5. Add and configure additional detection methods by repeating steps 2 – 4, if desired.



6. To add a preparation method, choose **Add a method to this protocol** and select **Add Preparation Method>Shake** or **Add Preparation Method>Set Temperature** from the menu.

OR

Right-click in Method Selection and select **Add Preparation Method>Shake** or **Add Preparation Method>Set Temperature** from the menu.

- **TRIAD** — Set Temperature is available only when controlling this instrument.

7. Configure Method Properties for the preparation method. Refer to Section 6.2.5.2.1, [Configuring a Shake Preparation Method](#), or Section 6.2.5.2.2, [Configuring a Set Temperature Preparation Method \(TRIAD only\)](#), for more information.
8. Add and configure additional preparation methods by repeating steps 6 and 7, if desired.



9. To change the order of detection and preparation methods executed in the sequence, in Method Selection, select the method to be moved and choose **Move the selected method forward** or **Move the selected method backward**.

OR

In Method Selection, right-click on the desired method and choose **Move Up** or **Move Down**.

Note: To move a kinetic or scan method, select **Kinetic** or **Scan** above the method desired to move, not the method itself.



10. To delete a detection or preparation method from the protocol, in Method Selection, select the method to be deleted and choose **Delete the selected method from this protocol**.

OR

In Method Selection, right-click on the desired detection or preparation method and choose **Remove Method**.

Note: To delete a kinetic or scan method, select **Kinetic** or **Scan** above the method desired to delete, not the method itself.

11. If multiple detection methods are configured in the sequence, in Method Selection, choose **Sequence**. Sequence Properties replaces Method Properties in the right pane.



12. In Method Properties, click in **Data Reduction** and choose the configuration button. Data Reduction Method appears (Figure 6-14).

Note: A data reduction method must be selected in all protocols that perform reads with multiple detection methods.

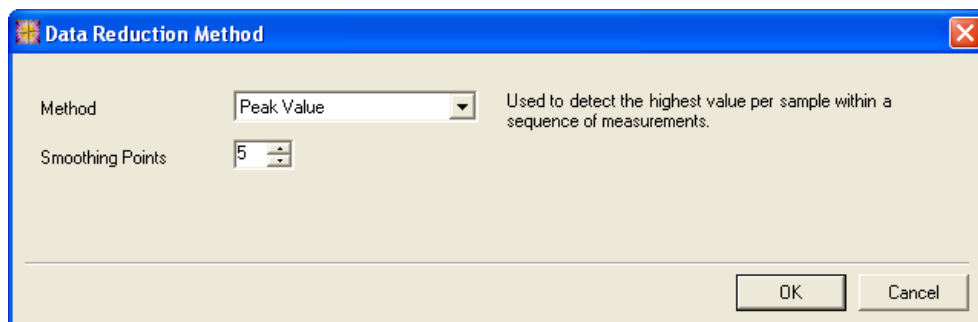


Figure 6-18. Selecting a data reduction method for the sequence

13. In Data Reduction Method, select the desired **Method**. If required by the selected method, additional parameters, such as smoothing points, appear.
14. Configure additional parameters for the selected data reduction method, if required.

Note: Refer to Table A-1 in [Appendix A: Data Reduction Techniques](#) for details about the data reduction methods available for kinetic measurements.

15. Choose **OK** to confirm the selection of the data reduction method.

16. Choose **Report Options** and select the method information and measurement results data included in printouts:

- **Reduced Data** — results calculated using the selected data reduction method. Available when kinetic measurements, scan measurements, or multiple detection methods are configured in the sequence.
- **Method Information** — details about the configured method, including technique type and filter(s) used.
- **Print in Matrix** — results arranged in a matrix corresponding to the plate layout. Available for single-point measurements only.
- **Graph** — kinetic or scan graphs of results for all measured samples. Available for kinetic and scan measurements only.
- **Raw Data** — results from each kinetic cycle or scan point. Available when kinetic measurements, scan measurements, or multiple detection methods are configured in the sequence.
- **Print Status** — status indicating whether or not the well was read successfully.

6.2.5.2.1 Configuring a Shake Preparation Method

A Shake preparation method may be placed in the desired location in the sequence, or attached to a kinetic measurement when interval shaking between each measurement cycle is desired.

To configure a Shake preparation method:

1. In Method Selection, choose the desired **Shake** preparation method. Method Properties for the selected method appear (Figure 6-19).

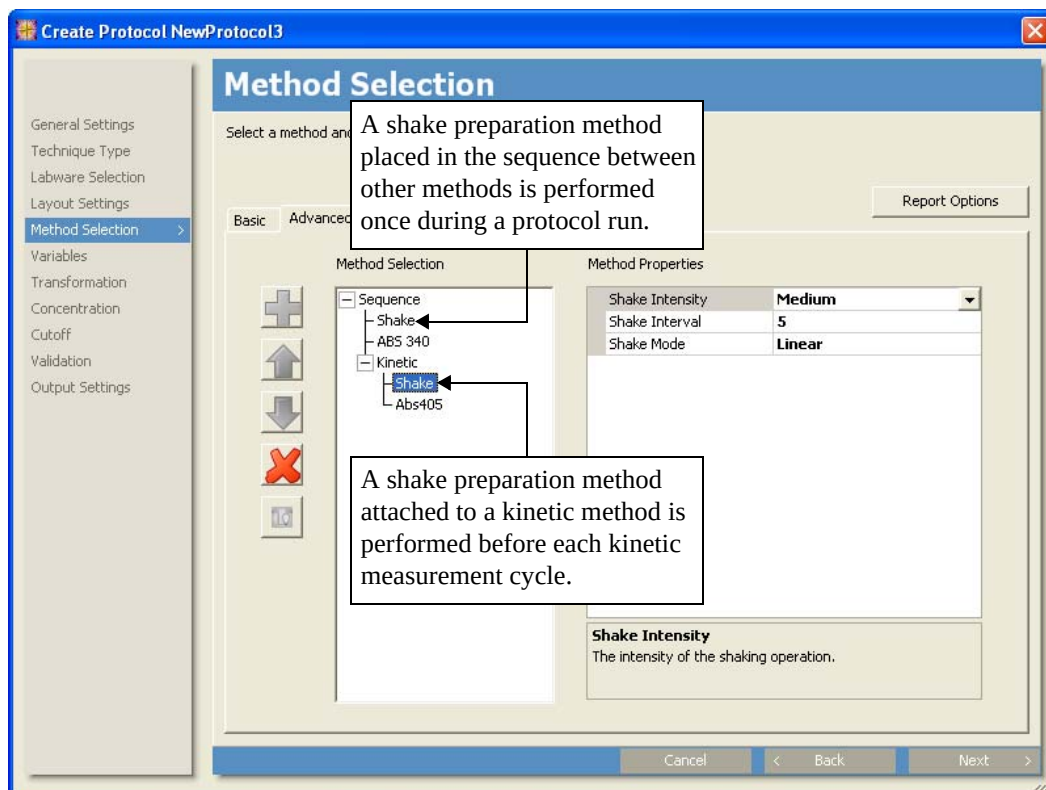


Figure 6-19. Configuring a Shake preparation method



CAUTION: Shake low density plates, such as 6- or 48-well plates, at low speed only. Shaking low density plates at higher speeds may cause liquid in wells to spill.

2. In Shake Intensity, select the desired intensity of shaking: **Low**, **Medium**, or **High**.
3. In Shake Interval, enter the length of time in seconds (**0–60**) to shake the microplate.
4. In Shake Mode, select the desired shaking pattern.
 - **Linear** — shakes from side to side.
 - **Orbital** — shakes labware in a circular pattern.
 - **Squared** — shakes labware in a square pattern, moving at right angles.

6.2.5.2.2 Configuring a Set Temperature Preparation Method (TRIAD only)

A Set Temperature preparation method sets the temperature inside the microplate chamber by heating the chamber; cooling the chamber is not supported. Depending on the light source used in the protocol, the set temperature may range from 3°C (5.4°F) or 4°C (7.2°F) above ambient to 45°C (113°F). A minimum of 30 minutes is required for the instrument to reach the desired temperature. The actual time required depends on the relative change in temperature.

When a protocol with a Set Temperature preparation method is run, the protocol does not pause to wait for the desired temperature to be reached. To set an exact temperature before starting a protocol run, use Manual Control to set the temperature and check it at regular intervals until the desired temperature is reached (refer to Section 2.3.3.1, [Temperature Control \(TRIAD only\)](#)).

Note: Set Temperature preparation methods are useful for kinetic measurements intended to measure the effects of temperature changes on samples.

To configure a Set Temperature preparation method:

1. In Method Selection, choose the desired **Set Temperature** preparation method. Method Properties for the selected method appear (Figure 6-20).

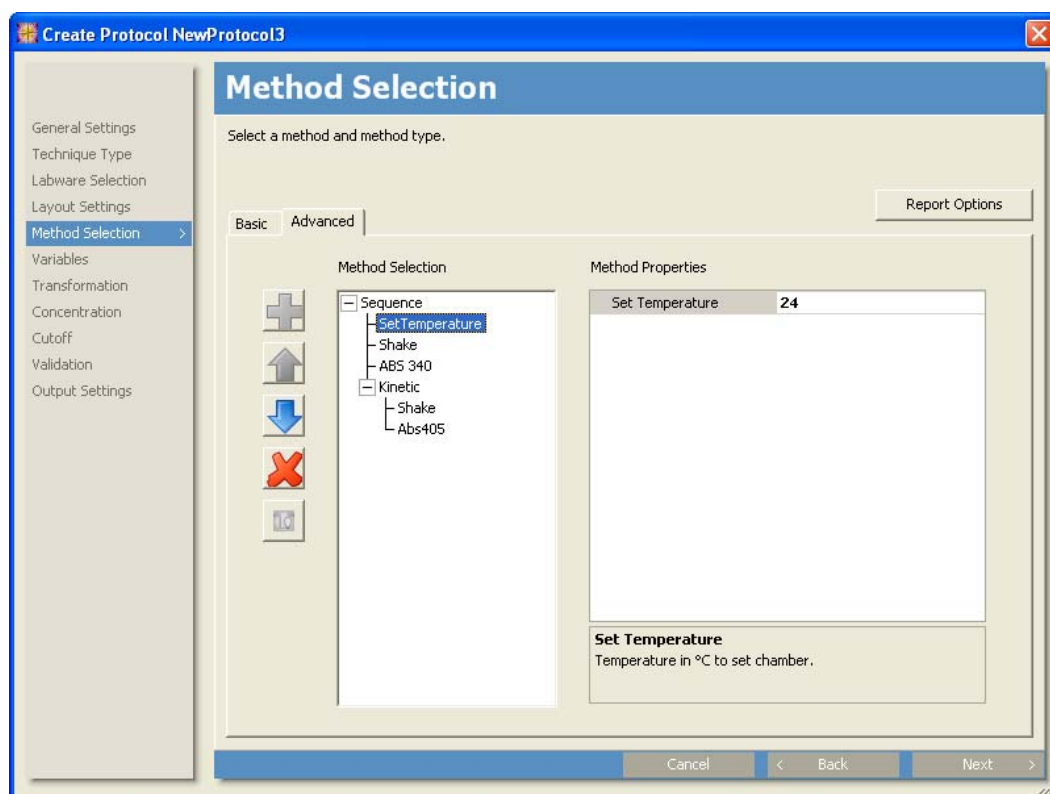


Figure 6-20. Configuring a Set Temperature preparation method

2. In **Set Temperature**, enter the desired microplate chamber temperature in degrees Celsius. In protocols that perform measurements only at visible wavelengths (>359 nm), the minimum temperature that may be set is 3°C (5.4°F) above ambient. When the protocol performs measurements in the UV band using the deuterium lamp, the minimum temperature is 4°C (7.2°F) above ambient. The maximum temperature that may be set is 45°C (113°F).

Note: The temperature remains at the current setting until overridden by another Set Temperature preparation method, by changing the temperature in Manual Control, or by turning the instrument off and on.

6.2.6 Configuring Variables (Concert - TRIAD Series Analysis Software only)

Up to ten variables may be defined for use in formulas configured in the protocol. (Figure 6-21). Variables are typically used with test kits that have cutoff values or standard correction values based on lot number.

Note: Variables appears only when selected in General Settings (refer to Section 6.2.1, [Configuring General Settings](#)).

Create Protocol Kinetic 340

Variables

Enter numeric values for up to 10 variables. Variables can be used in any formula defined in the protocol.

Number of variables: 3 Report Options

User Defined Variables

Variable Name	Value	Name to be used in reports
V1	.9	Var01
V2	1.1	Var02
V3	1.3	Var03

Cancel < Back Next >

Figure 6-21. Configuring variables in an analysis protocol

To configure variables:

1. Select the **Number of variables** to be configured. Up to ten variables may be configured. Entry fields for each variable appear.
2. For each variable, enter the desired **Value** and **Name to be used in reports**.
3. Choose **Report Options** and select **Definition** to include all variable names, values, and names used in reports in printouts, if desired.

6.2.7 Configuring a Transformation Formula (Concert - TRIAD Series Analysis Software only)

Use Transformation to configure an algebraic formula ($X' =$) that is applied to every well in a set of reduced data (X) (Figure 6-22). The transformation formula must include X , and may include mathematical operators, but not relational or logical operators. Refer to [Appendix B: Mathematical Operators and Functions](#), for more information about supported mathematical operators.

Note: For single point measurements, X represents the measured value.

Note: Transformation is available for configuration only when selected in General Settings (refer to Section 6.2.1, [Configuring General Settings](#)).

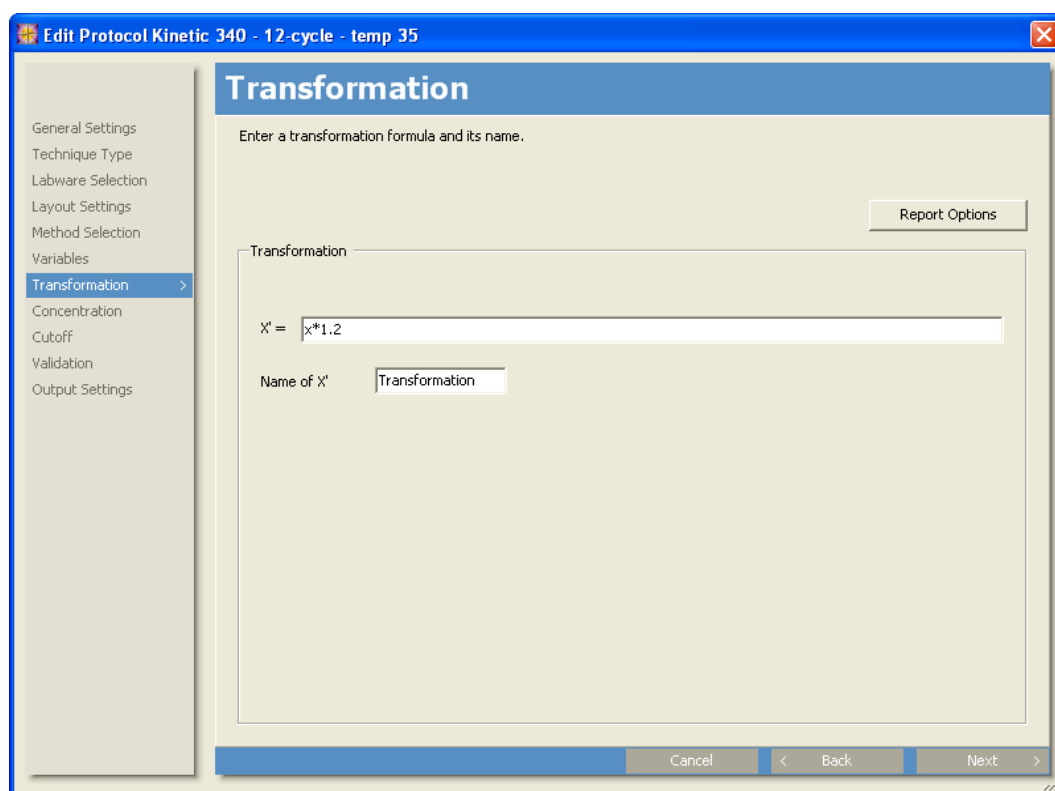


Figure 6-22. Configuring a transformation formula

To configure a transformation formula:

1. In $X' =$, enter the desired transformation formula. Refer to [Appendix B: Mathematical Operators and Functions](#), for detailed information about mathematical operators supported by the software.
2. In Name of X' , enter a new name for the transformation formula, if desired. The name appears in printed reports and in protocol configuration screens where a basis for evaluation must be selected.

3. Choose **Report Options** and select the transformation information included in printouts:

- **Definition** — the transformation formula and name are listed.
- **Print in Matrix** — the transformed result calculated for each sample appears in a measurement results matrix corresponding to the plate layout.
- **Print in List** — the transformed result calculated for each sample appears in a list of measurement results.
- **Print Status** — status indicating whether or not the well was read successfully.

6.2.8 Configuring Concentration (Concert - TRIAD Series Analysis Software only)

Use Concentration to choose a curve fitting method, preview the standard curve, and configure concentration and response formulas for standards (Figure 6-23).

Note: Concentration is available for configuration only when selected in General Settings (refer to Section 6.2.1, [Configuring General Settings](#)).

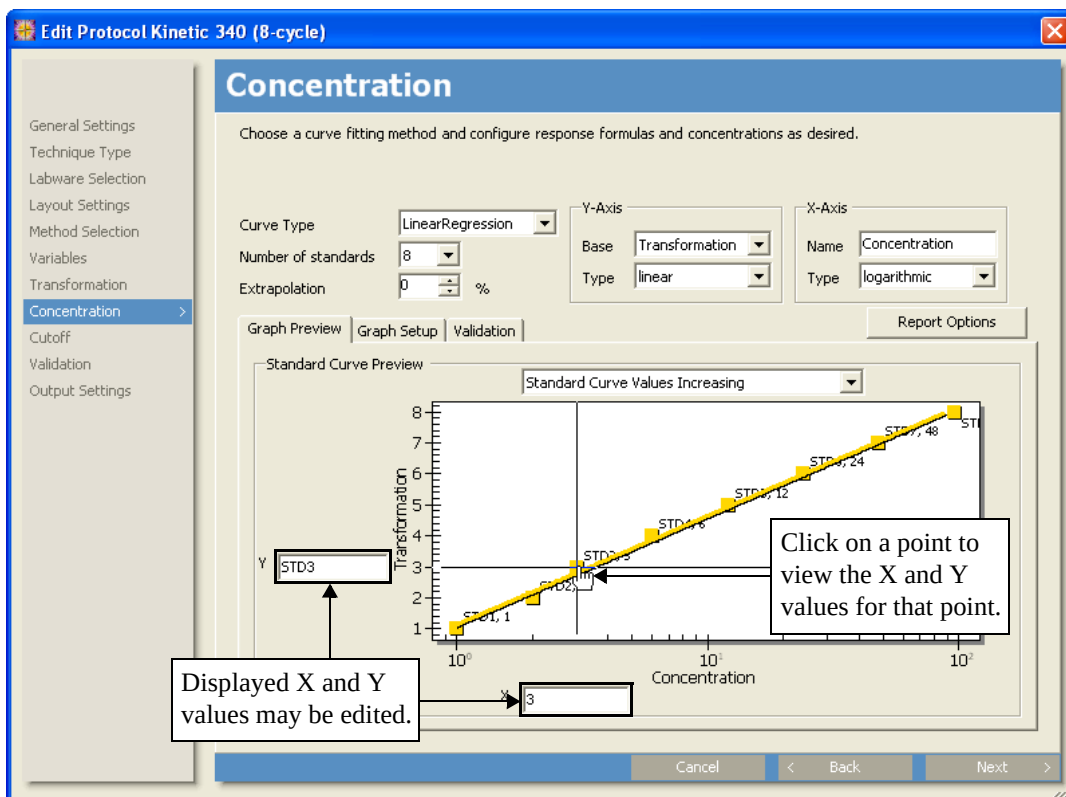
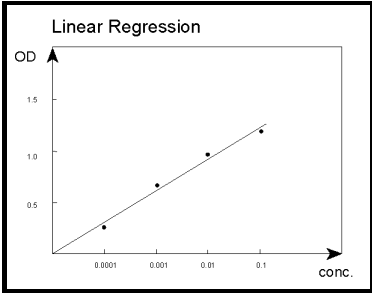
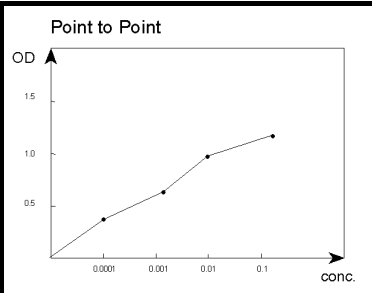
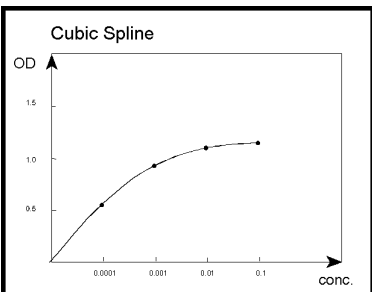
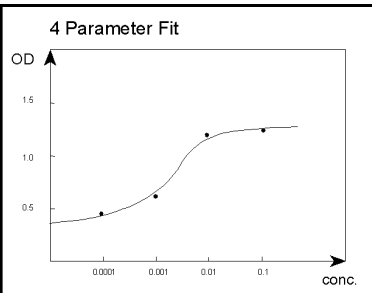


Figure 6-23. Configuring concentration parameters

To configure a standard curve and standards:

1. Select a Curve Type: **Point to Point**, **Linear Regression**, **Cubic Spline**, or **Four Parameter Fit**. Refer to Table 6-1 more information about curve fitting methods.

Table 6-1. Curve Fitting Methods

Method	Description	Example
Linear regression	Construction of a straight line using the least squares method with the highest possible approximation to all standard points. Requires a minimum of 2 standard points.	 The graph shows a linear relationship between OD (y-axis, 0 to 1.5) and concentration (x-axis, 0.0001 to 0.1). Four data points are plotted, and a straight line is drawn through them, starting from the origin.
Point to Point	Direct connection of all standard points. Requires a minimum of 2 standard points.	 The graph shows OD (y-axis, 0 to 1.5) versus concentration (x-axis, 0.0001 to 0.1). Four data points are plotted, and they are connected by straight line segments, starting from the origin.
Cubic Spline	All standard points are connected by the best fitting curve. Note: Can only be used for nonlinear and nonsigmoid functions. Requires a minimum of 3 standard points.	 The graph shows OD (y-axis, 0 to 1.5) versus concentration (x-axis, 0.0001 to 0.1). Four data points are plotted, and a smooth cubic spline curve is drawn through them, starting from the origin.
4 Parameter Fit	This procedure can be used only to characterize sigmoid curves. The curve is calculated according to the formula: $y_i = \frac{(a-d)}{\left[1 + \left(\frac{x_i}{c}\right)^b\right]} + d$ a = zero dose response (upper asymptote) d = infinite dose response (lower asymptote) c = dose level which results in a response midway between a and d b = slope factor Requires a minimum of 3 standard points.	 The graph shows OD (y-axis, 0 to 1.5) versus concentration (x-axis, 0.0001 to 0.1). Four data points are plotted, and a sigmoid (S-shaped) curve is drawn through them, starting from a non-zero value on the y-axis.

2. Select the Number of standards to configure. Up to 12 standards may be configured in a protocol. Standards configured in the labware layout are automatically added to Concentration.
3. In Extrapolation, enter a percentage value to extrapolate the standard curve above and below the highest and lowest standard points in the curve, if desired. Extrapolation may be configured for linear regression, cubic spline, and four parameter fit curve fitting methods.
4. In Y-Axis, select the Base for the axis

- **Measurement** — the reduced data from the protocol run.
- **Transformation** — the value calculated using the transformation formula configured in Transformation. This option is available only when Transformation is configured in the protocol (refer to Section 6.2.7, [Configuring a Transformation Formula \(Concert - TRIAD Series Analysis Software only\)](#)).

Note: Transformation is the default name for transformation formulas. If a different name is entered in Transformation, that name appears in Base (refer to Section 6.2.7, [Configuring a Transformation Formula \(Concert - TRIAD Series Analysis Software only\)](#)).

5. In Y-Axis, select the Type of scale for the Y-Axis: **linear** or **logarithmic**.

Note: Type is not available when configuring a four parameter fit curve.

6. In X-Axis, enter a **Name** for the axis, if desired.
7. In X-Axis, select the Type of scale for the X-Axis: **linear** or **logarithmic**.

Note: Type is not available when configuring a four parameter fit curve.

8. Choose **Report Options** and select the concentration information and data included in printouts
 - **Definition** — curve type, parameters, and statistics, such as intercept and slope.
 - **Graph** — the standard curve.
 - **Print in Matrix** — the transformed result calculated for each sample appears in a measurement results matrix corresponding to the plate layout.
 - **Print in List** — the transformed result calculated for each sample appears in a list of measurement results.
 - **Print Status** — status indicating whether or not the well was read successfully.

9. In Graph Preview, select the type of graph: **Standard Curve Values Increasing** or **Standard Curve Values Decreasing**. Select the type of graph that best represents how the concentrations of the standards are configured in the protocol. The graph preview refreshes to display the type selected.
10. In Graph Preview, click on any point to view the X and Y values for that point, if desired (Figure 6-23). The X and Y values currently displayed may be changed. Changes made in Graph Preview are reflected in Graph Setup.

11. Choose the **Graph Setup** tab to configure standards (Figure 6-24).

Edit Protocol Kinetic 340 - 12-cycle - temp 35

Concentration

Choose a curve fitting method and configure response formulas and concentrations as desired.

Curve Type: Y-Axis: Base Type X-Axis: Name Type

Number of standards: Extrapolation: %

Graph Preview | **Graph Setup** | Validation | Report Options

	Response Formula	Concentration
1	STD1	1
2	STD2	2
3	STD3	3
4	STD4	4
5	STD5	5
6	STD6	6
7	STD7	7
8	STD8	8

Cancel < Back Next >

Figure 6-24. Configuring standards

12. In Standards, edit each **Response Formula** and the corresponding **Concentration** as desired. Response formulas may contain any controls, standards, or variables defined in the test, as well as numerical constants and mathematical operators. A response formula is often simply the value of a measured standard, which is expressed as STD1, STD2, or STD3.

Note: Refer to [Appendix B: Mathematical Operators and Functions](#), for detailed information about mathematical operators supported by the software.

13. If configuring a linear regression curve fitting method, choose the **Validation** tab to validate the protocol based on acceptable coefficient of correlation, if desired (Figure 6-24).

Note: The Validation tab appears only when configuring a linear regression curve fitting method.

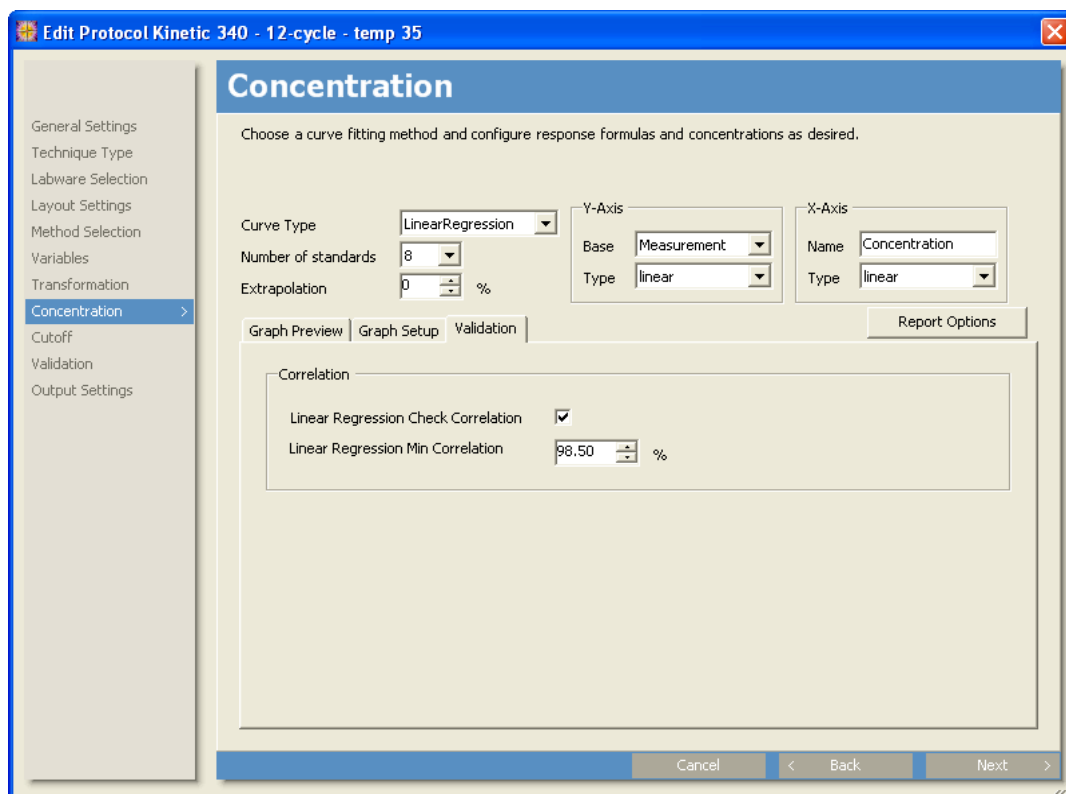


Figure 6-25. Configuring standard curve validation parameters

14. Choose **Linear Regression Check Correlation** to enable validation.
15. In **Linear Regression Min Correlation**, enter the minimum correlation percentage value for the test to be valid.

6.2.9 Configuring Cutoff Values (Concert - TRIAD Series Analysis Software only)

Use Cutoff to configure qualitative evaluations that classify measured samples into groups according to defined cutoff formulas or values (Figure 6-26). Up to ten groups may be configured.

Note: Cutoff is available for configuration only when selected in General Settings (refer to Section 6.2.1, [Configuring General Settings](#)).

Edit Protocol Kinetic 340 - 12-cycle - temp 35

Cutoff

Cutoff configures qualitative evaluations that classify measured samples according to defined cutoff values. Up to ten groups of samples may be classified using cutoff formulas. Groups are separated by the cutoff formulas.

Basis of Evaluation: Measurement

Number of groups: 3

Report Options

Groups and Cutoff Formulas

Name	Max Value	Cutoff Formulas / Values
Group 3: High	2.8	
Group 2: Ideal	2.2	
Group 1: Low	0	

Cancel < Back Next >

Figure 6-26. Configuring cutoff values

To configure cutoff groups and formulas:

1. Choose the **Basis of Evaluation**:

- **Measurement** — the reduced data from the protocol run.
- **Concentration** — the value calculated using the standard curve configured in Concentration. This option is available only when Concentration is configured in the protocol (refer to Section 6.2.8, [Configuring Concentration \(Concert - TRIAD Series Analysis Software only\)](#)).
- **Transformation** — the value calculated using the transformation formula configured in Transformation. This option is available only when Transformation is configured in the protocol (refer to Section 6.2.7, [Configuring a Transformation Formula \(Concert - TRIAD Series Analysis Software only\)](#)).

Note: Transformation is the default name for transformation formulas. If a different name is entered in Transformation, that name appears in Basis of Evaluation (refer to Section 6.2.7, [Configuring a Transformation Formula \(Concert - TRIAD Series Analysis Software only\)](#)).

2. Choose the **Number of groups** to configure.

3. Enter a **Name** for each group.

4. Enter the formulas and/or values used to classify samples into groups. The cutoff formula or value entered represents the maximum value included the group being configured; for example, in Figure 6-26, Group 2 (Ideal) includes all samples with values between 2.3 and 2.8.

Note: The results calculated from the formulas or the values entered must ascend. Results or values that do not ascend generate will generate an error during protocol runs.

5. Choose **Report Options** and select the cutoff information and data included in printouts:

- **Definition** — the basis for measurement, group names, and cutoff values and/or formulas configured.
- **Print in Matrix** — the cutoff group classification for each sample appears in a measurement results matrix corresponding to the plate layout.
- **Print in List** — the cutoff group classification for each sample appears in a list of measurement results.
- **Print Status** — status indicating whether or not the well was read successfully.

6.2.10 Configuring Validation Rules (Concert - TRIAD Series Analysis Software only)

Use Validation to configure up to ten validation rules (Figure 6-27). Protocol runs that do not meet the conditions specified in the rules are invalidated.

Note: Validation is available for configuration only when selected in General Settings (refer to Section 6.2.1, [Configuring General Settings](#)).

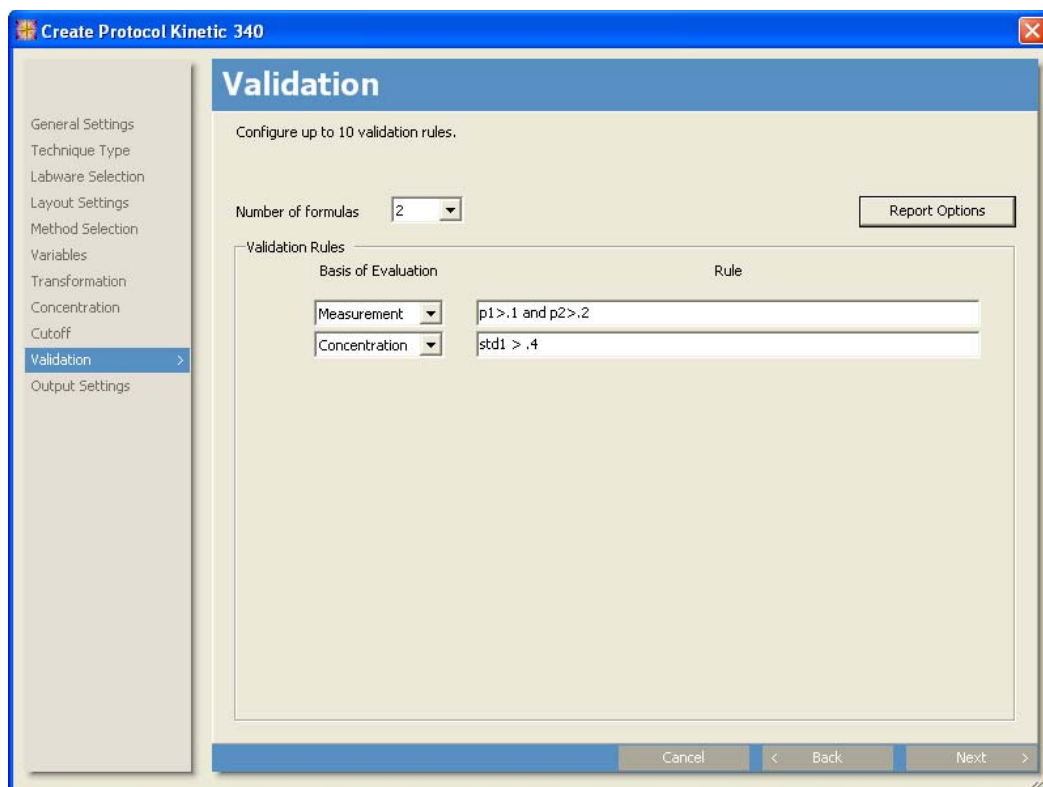


Figure 6-27. Configuring validation rules

To configure validation rules:

1. Choose the **Number of formulas** to configure. Up to ten formulas may be configured.
2. Choose the **Basis of Evaluation** for the first formula:
 - **Measurement** — the reduced data from the protocol run.
 - **Concentration** — the value calculated using the standard curve configured in Concentration. This option is available only when Concentration is configured in the protocol (refer to Section 6.2.8, [Configuring Concentration \(Concert - TRIAD Series Analysis Software only\)](#)).
 - **Transformation** — the value calculated using the transformation formula configured in Transformation. This option is available only when Transformation is configured in the protocol (refer to Section 6.2.7, [Configuring a Transformation Formula \(Concert - TRIAD Series Analysis Software only\)](#)).

Note: Transformation is the default name for transformation formulas. If a different name is entered in Transformation, that name appears in Basis of Evaluation (refer to Section 6.2.7, [Configuring a Transformation Formula \(Concert - TRIAD Series Analysis Software only\)](#)).

3. Enter the first formula. Formulas may contain:
 - any controls, standards, or variables defined in the protocol. For controls and standards, use the same labels displayed in **Layout Settings**; for example, **STD1** for standard 1, **C2** for control 2, **P5** for positive control 5, or **N2** for negative control 1.
 - numeric constants.
 - mathematical operators and functions and logical operators. Refer to [Appendix B: Mathematical Operators and Functions](#), for a complete list of supported operators and functions.

Table 6-2. Example test validation formulas

Application	Validation Formula
The results from a protocol run are valid only if the mean absorption value of the positive control well(s) P2 is less than or equal to 0.8 OD.	$P2 \leq 0.8$
The results from a protocol run are valid only if both controls are within the linear range of the instrument.	$0.1 \leq C1 \text{ AND } C1 \leq 3.0 \text{ AND } 0.1 \leq C2 \text{ AND } C2 \leq 3.0$

4. Repeat steps 2 and 3 for any additional formulas.
5. Choose **Report Options** and select **Definition** to include the validation configuration and state (pass/fail) for all rules in printouts.

6.2.11 Configuring Output Settings

Use Output Settings to specify which measurement result export, view, and print actions are performed automatically when a protocol run completes (Figure 6-28). An external software application, such as a notification utility, may also be configured to execute when a run completes.

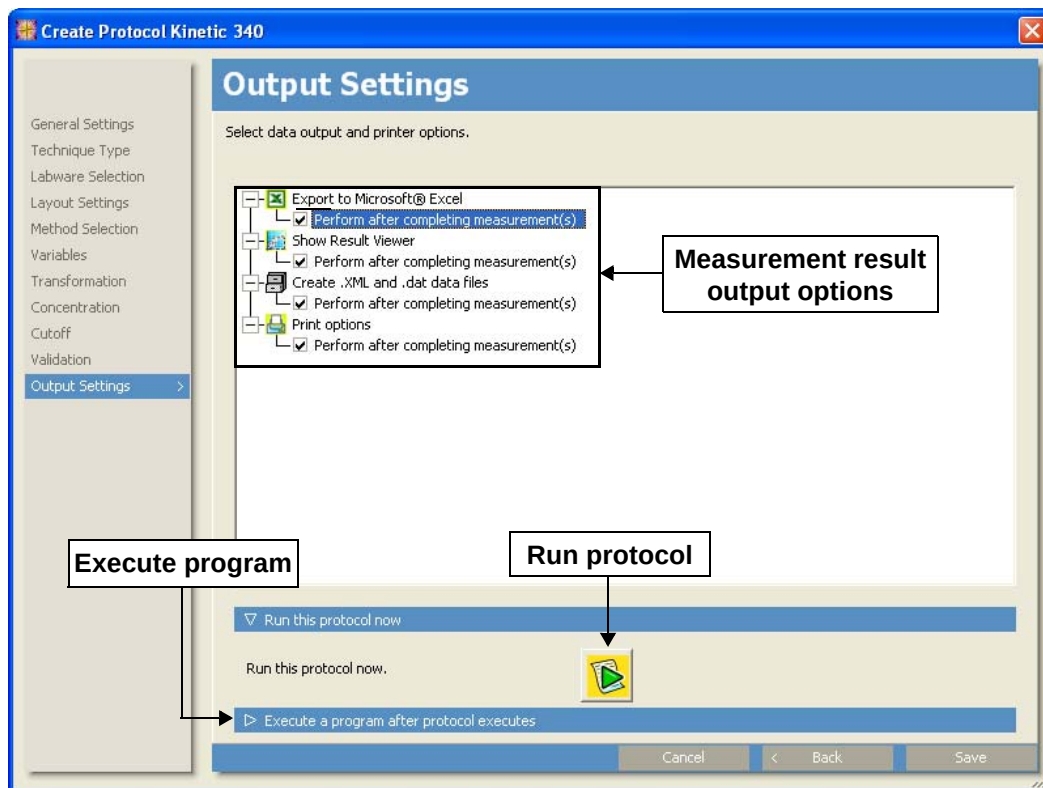


Figure 6-28. Configuring output settings

To configure Output Settings:

1. Choose export, view, and print output options as desired. Table 6-3 describes the options available.



2. Choose **Run protocol now** to run the protocol. Refer to Section 6.3, [Running Protocols](#), for more information about running protocols.

Note: When creating or editing a protocol, the protocol must be saved before it can be run. After saving the protocol, Run Protocol appears for protocols that were edited; new protocols must be selected in the Protocol Selection List before they may be run.

3. Choose **Execute a program after protocol executes** to display options for configuring an external software application to run after the protocol run is completed. Refer to Section 6.2.11.1, [Configuring a Program to Execute after a Protocol Run Completes](#), for more information.

Table 6-3. Output Options

Output Option	Description
Export to Microsoft® Excel	Saves results in a format compatible with Microsoft® Excel, and automatically opens Excel after completing a protocol run. Note: Versions of Excel prior to Office 2000 are not supported by the Export to Microsoft Excel function, but can open measurement results stored in tab-delimited data (.dat) files.
Show Result Viewer	Automatically opens the measurement results in the Result Viewer after completing a protocol run (refer to Section 7.2, Viewing Measurement Results in the Result Viewer).
Create .XML and .dat data files	Automatically exports measurement results to a tab-delimited data (*.dat) file and an XML file. These files may be opened by software applications compatible with tab-delimited data or XML files. Note: The directory where the data files are saved is configured in System Settings. Refer to Section 1.4.2.3, Choosing the Directory Where Exported Measurement Results are Saved.
Print options	Automatically prints the results after completing a protocol run.

6.2.11.1 Configuring a Program to Execute after a Protocol Run Completes

Output Settings can be configured to open an external software application after completing a protocol run. If the selected application supports entering commands using a command line interface, a specific command for the application may also be configured.

To configure a program to run after a protocol is executed:

1. In Output Settings, choose **Execute a program after protocol executes**. Two configuration fields appear (Figure 6-29).

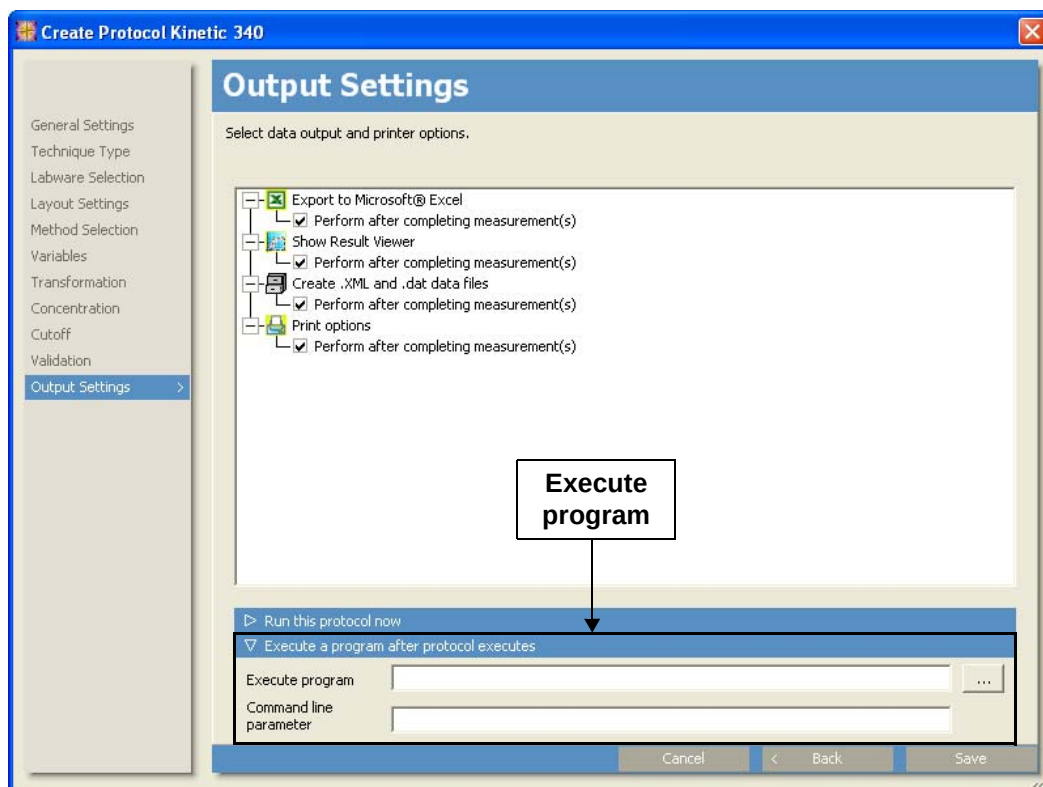


Figure 6-29. Configuring an external software application in Output Settings

2. In Execute Program, enter the complete path of the program to run; for example, **C:\Windows\System32\Net.exe**. Net.exe is a small utility supplied with Windows® operating systems that sends messages to computers on the same network.

OR

Select **Choose an external program to run at the end of measurement**. Open appears.

3. In Open, browse to the location of the desired application and select it.
4. Choose **Open** to return to Output Settings. The selected path appears in Execute Program.

OR

Choose **Cancel** to close Open without selecting an application.

5. If the selected application supports command line parameters, in **Command line parameter**, enter the desired parameter. For example, if using Net.exe, entering the parameters "**SEND**" "**Workstation1**" "**Finished**" instructs the application to send the message, "Finished," to a computer named Workstation1 when the protocol run completes.

6.2.12 Signing a Protocol

When Signet is enabled on the system, protocols may be signed to prevent the configured parameters from being edited. Protocols may be signed at any time after the configuration is complete.

Protocols may be signed by users who are assigned a role containing the Sign permission. Refer to Section 3.3.1.1, [Configuring Roles for Concert - TRIAD Series Software User Accounts](#), for more information about roles and permissions.

To sign a protocol:

1. In the Protocol Selection List, select the protocol to sign.
2. From the toolbar, choose **Sign the selected protocol**. Sign the Selected Item appears.



OR

From the **Actions** menu, choose **Sign the selected protocol**.

OR

Right click on the selected labware and choose **Sign the selected protocol**.

3. In **Sign the Selected Item**, add comments and an electronic signature by following the instructions in Section 3.4.5, [Adding Electronic Signatures and Comments to Items](#).

6.3 Running Protocols

Saved protocols may be accessed and run at any time, either on an instrument or in simulation mode. The run options available are different for each mode. For more information, refer to:

- [Running a Protocol on an Instrument](#) (Section 6.3.1).
- [Running a Protocol When Simulation Mode is Enabled](#) (Section 6.3.2).

6.3.1 Running a Protocol on an Instrument

Running a protocol on an instrument performs measurements on samples and outputs results data following the parameters configured in the protocol.

To run a protocol on an instrument:



1. In the Protocol Selection List, select the protocol to run.
2. From the toolbar, choose **Run the selected protocol**. Prepare to Run appears (Figure 6-30).

Note: When running an Analysis protocol with variables configured, Variables appears as the first screen in Run Protocol. Change the values of the variables, if desired, and choose **Next** to continue. Prepare to Run appears.

OR

From the Actions menu, choose **Run the selected protocol**.

OR

Right-click on the selected protocol and choose **Run the selected protocol** from the menu.

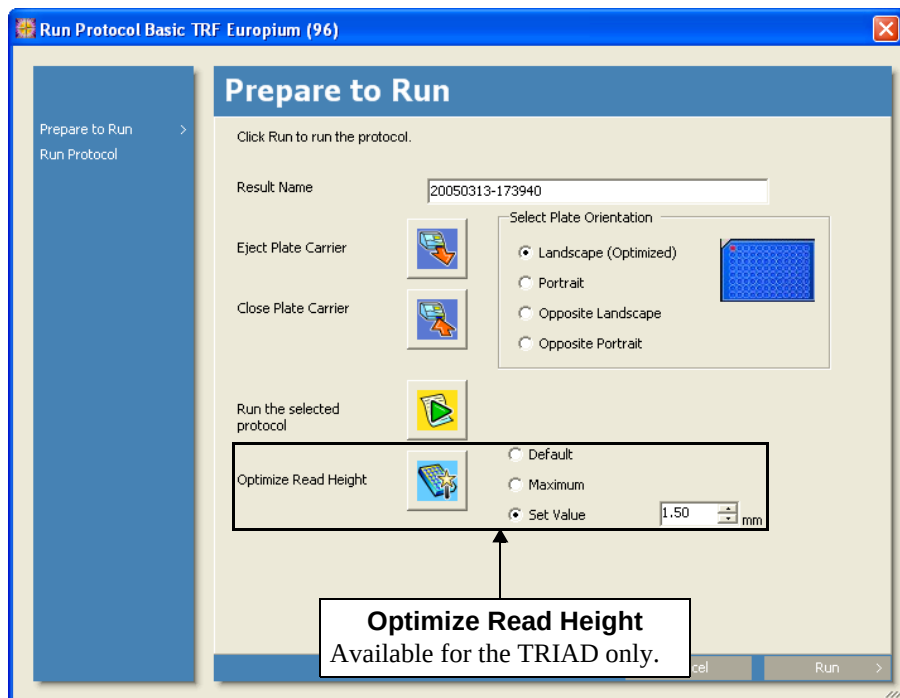


Figure 6-30. Preparing to run a protocol on an instrument

3. Enter a new **Result Name**, if desired.
4. Use **Eject Plate Carrier** and **Close Plate Carrier** to load the microplate into the instrument, if necessary.
5. Select the orientation that matches how the plate is positioned on the plate carrier:
 - **Landscape** — the long edges of the plate run parallel to the front of the instrument, with well A1 located in the upper left corner.
 - **Portrait** — the short edges of the plate run parallel to the front of the instrument, with well A1 located in the upper right corner.
 - **Opposite Landscape** — the edges of the plate run parallel to the front of the instrument, with well A1 located in the lower right corner.
 - **Opposite Portrait** — the short edges of the plate run parallel to the front of the instrument, with well A1 located in the lower left corner.

Note: Well A1 is identified in the plate graphic by a red highlight.



6. When preparing to run a luminescence, fluorescence top, fluorescence polarization, or time-resolved (TRF) protocol, choose **Optimize Read Height** to automatically determine and set the optimal read height used in the protocol run (refer to Section 6.3.1.1, [Optimizing Read Height \(TRIAD only\)](#)).

➤ **TRIAD** — Optimize Read Height is available for this instrument only.

OR

Select the read height manually:

- **Default** — uses the read height defined in Labware Information for the labware type used in the protocol (refer to Section 5.2.1, [Defining Labware Information](#)).
- **Maximum** — sets the read height at 11 mm, the maximum height supported by the instrument.
- **Set Value** — manually sets the reading height using the adjacent configuration field. Setting the reading height manually is useful when the height determined by a prior optimization for the same labware type is known.



7. Choose **Run** to start the protocol run.

OR

Choose **Cancel** to close Run Protocol without running the protocol.

6.3.1.1 Optimizing Read Height (TRIAD only)

The TRIAD features an objective lens that may be moved up and down to optimize the read height used in luminescence, fluorescence intensity top, fluorescence polarization, and time-resolved fluorescence protocols. Read height is the distance between the top surface of the microplate being read and the lower surface of the objective lens. Optimizing read height matches the focus of the optics with the sample volume. This maximizes the raw signal, which yields the highest precision and maximum sensitivity.

Read height is optimized using the Read Height Optimization Wizard (Figure 6-31). A single sample with a known maximum signal is placed on the same type of microplate used in the protocol. The sample is measured using the same, or very similar, detection method used in the protocol.

The optimized read height is saved in the protocol and is used for all subsequent runs of the protocol until reset by performing a new optimization or manually selecting a read height option.

To optimize read height:



1. In Run Protocol, select **Optimize Read Height**. The Read Height Optimization Wizard appears (Figure 6-31).

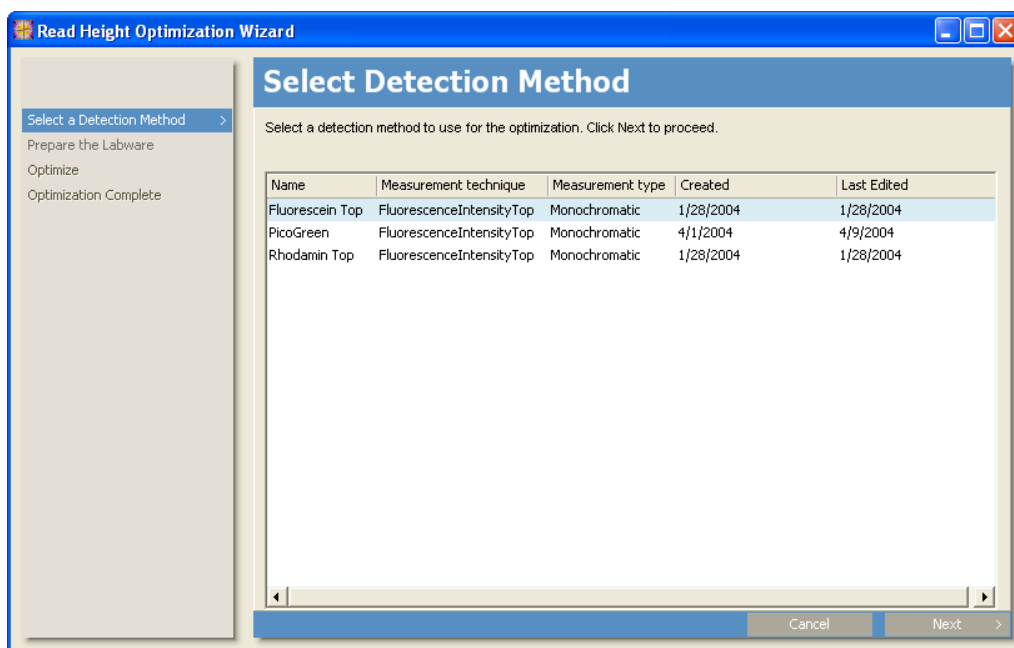


Figure 6-31. Selecting the detection method used in the read height optimization

2. In **Select Detection Method**, select the detection method used in the optimization. Only detection methods configured in the protocol are available for selection.
3. Choose **Next** to select the well measured to perform the optimization. **Prepare Labware** appears (Figure 6-32).

OR

Choose **Cancel** to close the wizard without performing the optimization.

4. Pipette liquid with a known maximum signal to a single well on the microplate used in the optimization. The concentration of the optimization sample should be at least ten times greater than the detection limit. The sample volume should be the same as that of samples measured in the protocol.

Note: When optimizing reading height for a fluorescence protocol, make sure the optimization sample is the same fluorescent substance the detection method is configured to detect.

5. Load the plate into the instrument.

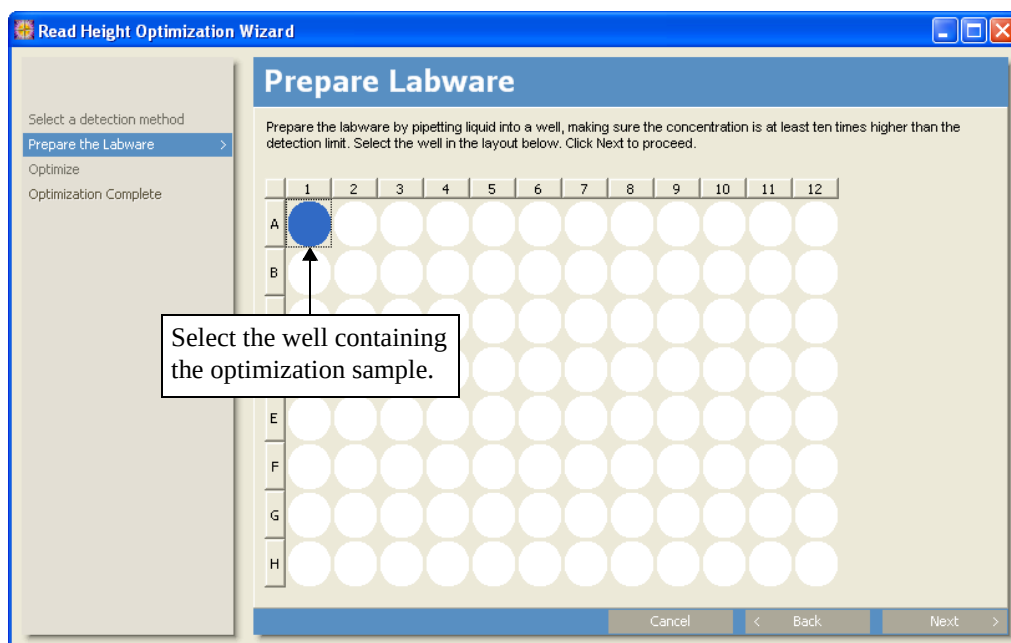


Figure 6-32. Selecting the well read in the read height optimization

6. In **Prepare Labware**, select the well containing the optimization sample (Figure 6-32).
 7. Choose **Next** to start the optimization. **Optimization in Progress** appears (Figure 6-33). The optimization may take several minutes.
- OR
- Choose **Back** to change the detection method used in the calibration.
- OR
- Choose **Cancel** to close the wizard without performing the optimization.

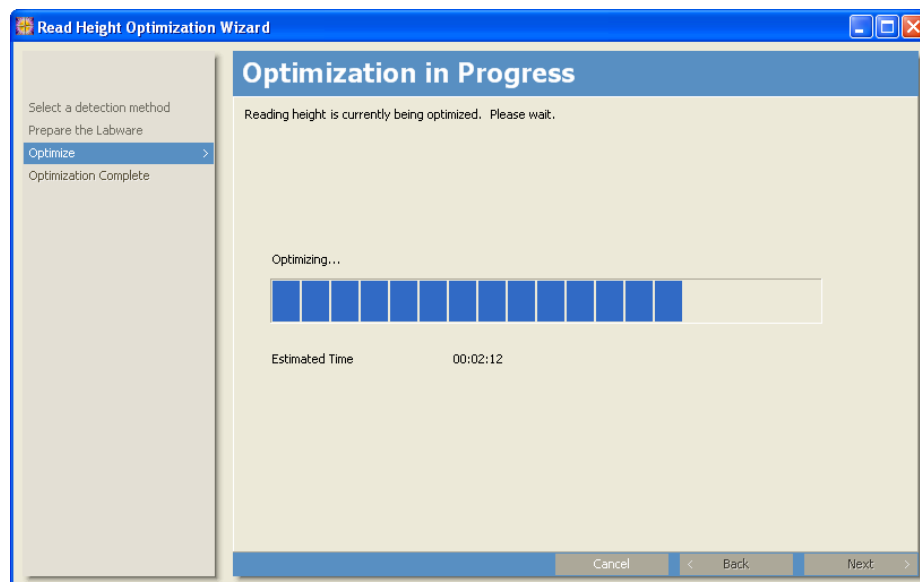


Figure 6-33. Read height optimization in progress

8. While the optimization is in progress, choose **Cancel** to stop the optimization read and close the wizard, if desired. When the read is finished, **Optimization Complete** appears, displaying the Optimized Read Height (Figure 6-34).

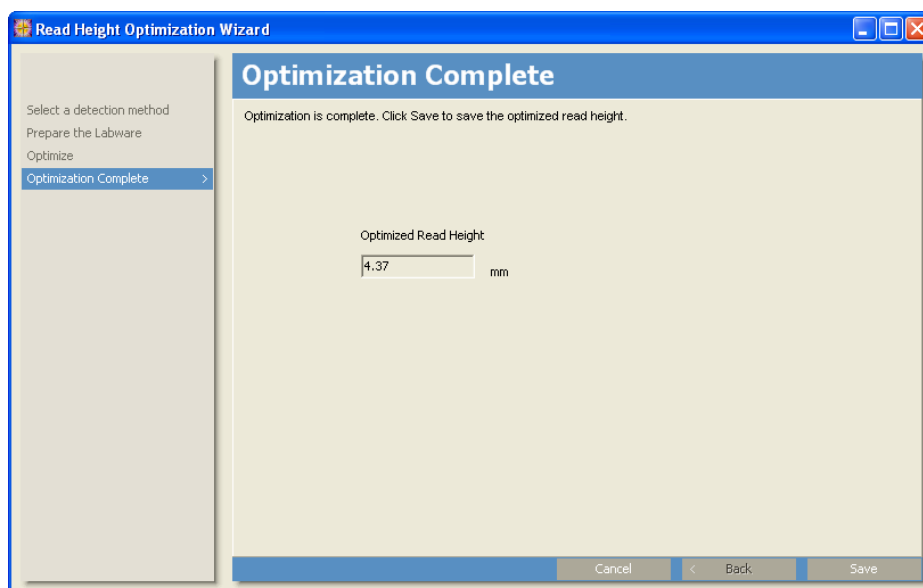


Figure 6-34. Read height optimization completed

9. In **Optimization Complete**, choose **Save** to save the optimized read height in the protocol. The optimized read height is used for all subsequent runs of the protocol until reset by performing a new optimization or manually selecting a read height option.

OR

Choose **Cancel** to close the wizard without saving and using the optimized read height in the protocol run.

6.3.2 Running a Protocol When Simulation Mode is Enabled

Running a protocol in simulation mode allows the protocol configuration to be tested using simulated data before performing the protocol on actual samples. Simulated data is either generated randomly or read from a data file.

Simulation mode is automatically enabled when the host computer is not connected to an instrument. When an instrument is connected, simulation mode may be enabled manually in Instruments (refer to Section 2.2.5, [Enabling Simulation Mode](#)).

To run a protocol in simulation mode:

1. In the Protocol Selection List, select the protocol to run.
2. From the toolbar, choose **Run the selected protocol**. Prepare to Run appears (Figure 6-35).



Note: When running an Analysis protocol with variables configured, Variables appears as the first screen in Run Protocol. Change the values of the variables, if desired, and choose **Next** to continue. Prepare to Run appears.

OR

From the Actions menu, choose **Run the selected protocol**.

OR

Right-click on the selected protocol and choose **Run the selected protocol** from the menu.

Figure 6-35. Preparing to run a protocol in simulation mode

3. Enter a new **Result Name**, if desired.
4. Select **Check to generate random data** to run the protocol using random data generated by the software, if desired.
5. In Use this data simulation file for this read:
 - Leave the directory path of the simulated data path as configured to use the data file selected in Software Settings (refer to Section 1.4.2.2, [Choosing Simulated Data Files](#)).
 - Enter the directory path of the desired data file. The complete directory path must be entered; for example, **c:\detection software\simulations\simulated absorbance data.dat**.
 - Browse to the location where the desired data file is saved and select it.



Note: Results from prior measurements saved in .dat format may be used as simulated data files (refer to Section 6.2.11, [Configuring Output Settings](#)). Simulated data files are used when the number of measurement points in the simulated protocol run is the same as those present in the data file. When the number of measurement points is different, the software generates random data.

When a different simulated data file is selected in Prepare to Run Protocol, the file is used for the current simulated run only. After the simulated run has finished, the data file defaults to the file selected in Software Settings (refer to Section 1.4.2.2, [Choosing Simulated Data Files](#)).



6. Choose **Run** or **Next** to run the selected protocol.

OR

Choose **Cancel** to close Run Protocol without running the protocol.

6.4 Editing Protocols

Parameters configured in a protocol may be edited. When the optional Signet module is enabled on the system, signed protocols may not be edited.

Note: When Signet is enabled on the system, only users assigned a role containing the Edit permission may edit protocol definitions. Refer to Section 3.3.1.1, [Configuring Roles for Concert - TRIAD Series Software User Accounts](#), for more information about roles and permissions.

To edit a protocol:

1. In the Protocol Selection List, select the protocol to edit.



2. From the toolbar, choose **Edit the selected protocol**. Edit Protocol appears (Figure 6-36).

OR

From the Actions menu, choose **Edit the selected protocol**.

OR

Right-click on the selected protocol and choose **Edit the selected protocol** from the menu.

OR

Double-click on the selected protocol.

Edit Protocol Basic Absorbance Multiwavelength (96)

General Settings

Please enter a name and notes for this protocol.

Protocol name: Basic Absorbance Multiwavelength (96)

Date created: Wednesday, April 07, 2004

Date edited: Sunday, March 13, 2005

Date last run: Wednesday, April 07, 2004

Notes: Multiple wavelength absorbance measurement at 260nm, 340nm, 405nm, 450nm, 595nm and 620nm with 5sec shake in between each read
Auto-export data to Excel

Cancel Next

Figure 6-36. Editing an absorbance protocol

3. Edit the parameters in each Edit Protocol screen as desired.

Note: Refer to Section 6.2, [Creating Basic and Analysis Protocols](#), for detailed information about configuring protocol parameters.

4. Choose **Save** to close Edit Protocol and save the changes.

OR

Choose **Cancel** to close Edit Protocol without saving changes.

6.5 Copying Protocols

Copies may be made of existing protocols. A copy of an existing protocol may be used as a template for a new protocol using the same technique.

Note: When Signet is enabled on the system, only users assigned a role containing the Copy permission may create copies of protocols. Refer to Section 3.3.1.1, [Configuring Roles for Concert - TRIAD Series Software User Accounts](#), for more information about roles and permissions.

Signed protocols may be copied. Copies of signed protocols are unsigned and may be edited.

To make a copy of a protocol:

1. In the Protocol Selection List, select the protocol to copy.



2. From the toolbar, choose **Make a copy of the selected protocol**. A copy of the selected protocol appears in the Protocol Selection List.

OR

From the ACTIONS menu, choose **Make a copy of the selected protocol**.

OR

Right-click on the selected protocol and choose **Make a copy of the selected protocol** from the menu.

Note: The default name format for copied protocols is Copy of OriginalName. To change the name, open the protocol for editing and enter the new protocol name (refer to Section 6.4, [Editing Protocols](#)).

6.6 Deleting Protocols

Protocols that are no longer used to perform measurements may be deleted from the Protocol Selection List. When the optional Signet module is enabled on the system, signed protocols may not be deleted.

Note: When Signet is enabled on the system, only users assigned a role containing the Delete permission may delete protocols. Refer to Section 3.3.1.1, [Configuring Roles for Concert - TRIAD Series Software User Accounts](#), for more information about roles and permissions.

To delete a user-defined protocol:

1. In the Protocol Selection List, select the protocol to delete.
2. From the toolbar, choose **Delete the selected protocol**. Message appears (Figure 6-37).



OR

From the Actions menu, choose **Delete the selected protocol**.

OR

Right-click on the selected protocol and choose **Delete the selected protocol** from the menu.

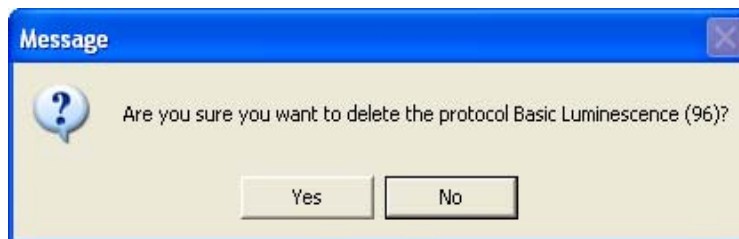


Figure 6-37. Confirming the deletion of a protocol

3. Choose **Yes** to delete the selected protocol.

OR

Choose **No** to cancel the deletion.

6.7 Printing Protocol Configuration Information

Information about the protocol configuration and sample layout may be printed separately from measurement results.

To print protocol configuration information:

1. In the Protocol Selection List, select the protocol to print.
2. From the toolbar, choose **Print the selected protocol**.



OR

From the Actions menu, choose **Print the selected protocol**.

OR

Right-click on the selected protocol and choose **Print the selected protocol** from the menu.

Note: Depending on how Print Settings are configured, Print and/or Print Preview may appear before the protocol configuration prints. Refer to Section 1.4.2.1, [Configuring Print Settings](#), for more information about enabling and disabling Print and Print Preview.

3. If Show Printer Settings and Print Preview are not enabled in Print Settings, no additional configuration is required.

OR

If Print appears, configure printing options as desired and choose **OK**.

Note: Print is the dialog box that appears when Show Printer Settings is selected.

OR

If Print Preview appears, use the toolbar controls to change the magnification, layout view, or page(s) displayed, if desired (Figure 6-38).

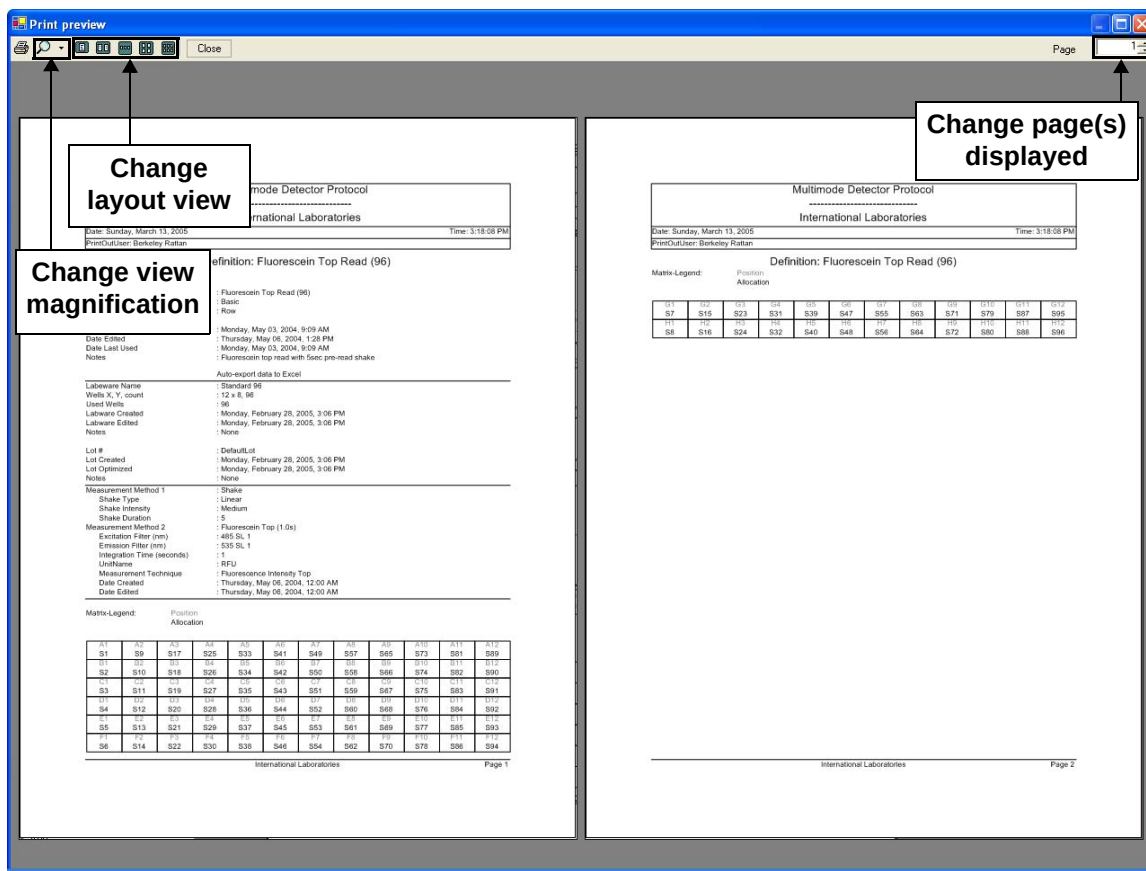


Figure 6-38. Previewing a protocol configuration and sample layout printout



4. In Print Preview, choose **Print** to print out the measurement results.



5. In Print Preview, choose **Close** to close the window.

Note: Choosing Close without first choosing Print cancels the printout.

6.8 Exporting and Importing Protocols

A protocol can be exported to an XML file, which may be imported at a later time to restore the configuration saved in the file or shared with a copy of Concert - TRIAD Series Software installed on another system. Detection method(s) and labware configurations used in the protocol are also saved in the export file.

Protocols that use default detection methods and labware installed with Concert - TRIAD Series Software may be imported and exported; however, default methods and labware are not imported with the protocol because these items are present on all systems and may not be edited, deleted, or overwritten.

Note: When Signet is enabled, signed protocols may be exported for use on another system; however, electronic signatures attached to the protocol are not retained, which allows the protocol to be edited. Importing a signed method to the system from which it was originally exported is not permitted because signed methods may not be deleted or overwritten.

To export a protocol:

1. In the Protocol Selection List, select the protocol to export.
2. From the File menu, choose **Export>Protocol**. Browse for Folder appears (Figure 6-39).

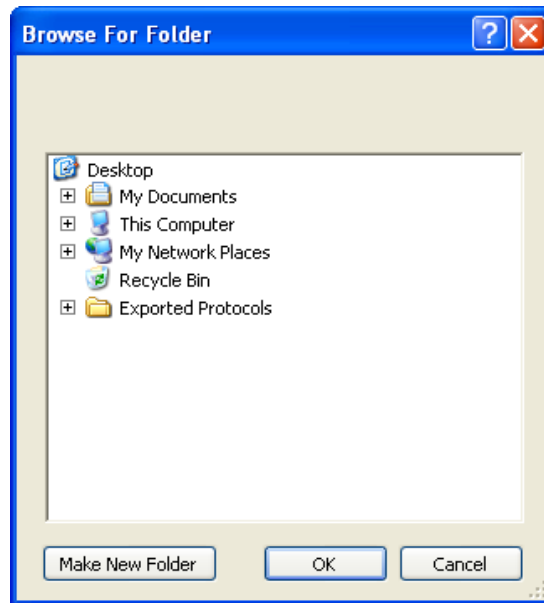


Figure 6-39. Choosing the folder where an exported protocol will be saved

3. In Browse for Folder, browse to the folder where the exported protocol will be saved.

OR

Choose **Make New Folder** to create a new folder where the exported protocol will be saved.

4. Choose **OK** to export the protocol. The exported protocol is saved using the default file name format, **Protocol_*ProtocolName*.xml**. In order to import the file at a later date, the filename must not be changed.

OR

Choose **Cancel** to stop the operation without exporting the protocol.

To import a protocol from an exported XML file:

1. From the **File** menu, choose **Import>Protocol**. **Open** appears.
2. In **Open**, browse to and select the desired XML file to import.
3. Choose **Open**. The protocol, as well as detection method(s) and labware used in the protocol, are imported. Any default detection method(s) or labware used in the protocol are not imported because default methods and labware may not be edited, deleted, or overwritten. Instead, the imported protocol uses the same default methods and labware stored in the software.

7 Viewing Measurement Results

7.1 Overview

Measurement results from each protocol run are stored in the Concert - TRIAD Series Software database and are accessed from the Results Selection List (Figure 7-1), which also provides access to result actions and the ability to search for specific results based on names and/or dates.

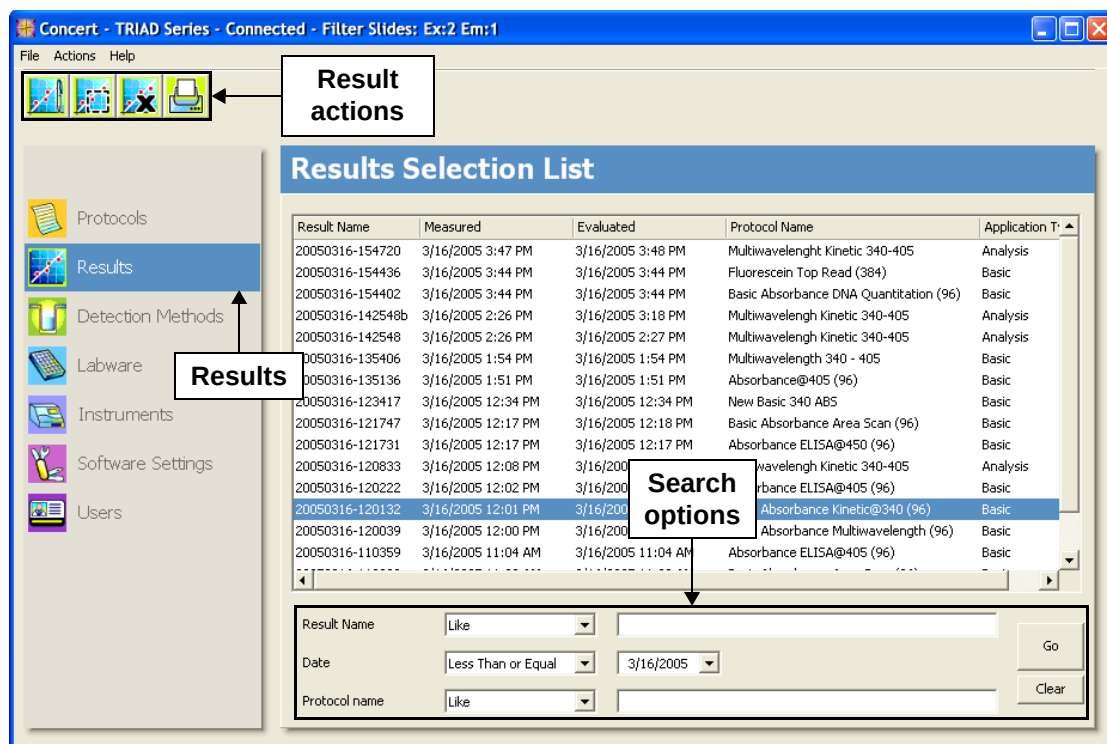


Figure 7-1. Accessing measurement result actions

Measurement results selected from the list are viewed in the **Result Viewer**, which, depending on measurement type, displays raw data from each measurement technique, measurement cycle or point, reduced data, and graphs. Results calculated using a data reduction method may be reevaluated using different parameters.

When the optional Concert - TRIAD Series Analysis Software module is installed, results may be reevaluated by editing analysis parameters configured in the protocol.

Result actions covered in this chapter include:

- [Viewing Measurement Results in the Result Viewer](#) (Section 7.2).
- [Viewing and Reevaluating Results from an Analysis Application](#) (Section 7.3).
- [Viewing Exported Measurement Results](#) (Section 7.4).

Note: This section includes viewing measurement results exported to Microsoft® Excel from the **Result Viewer** and results exported to .XML or data files at the completion of a protocol run.

- [Signing Measurement Results](#) (Section 7.5).
- [Deleting Measurement Results](#) (Section 7.6).
- [Printing Measurement Results](#) (Section 7.7).

To view measurement results:

1. From the navigation pane, choose **Results**. The Results Selection List appears (Figure 7-1).



2. In the Results Selection List, select the desired results and from the toolbar, choose **View the selected result**. The Result Viewer appears (Figure 7-2).

OR

Use the search options to locate specific results. Table 7-1 describes the search options available. Results matching the search parameters appear in the **Results Selection List**.

Table 7-1. Measurement Results Search Options

Search Option	Description
Result Name	Enter a partial or complete Result Name . Searching for result names may also be limited to specific date(s) configured in Date.
Date	Select the desired range option: Less Than or Equal , Equal , Greater Than or Equal , or Between , then choose the desired date(s).
Protocol Name	Enter a partial or complete Protocol Name . Searching for protocol names may also be limited to specific date(s) configured in Date.
Go	Perform the search. Matching results appear in the Results Selection List.
Clear	Clear search results and display all measurement results in the Results Selection List.

7.2 Viewing Measurement Results in the Result Viewer

Measurement results accessed from the Results Selection List are viewed in the Result Viewer (Figure 7-2). Results are displayed in a series of tabs. The tabs displayed depend on the measurement type(s) configured in the protocol; for example, reduced data is not displayed when data reduction is not configured.

Results may also be printed, saved, or exported to a Microsoft® Excel spreadsheet using the Result Viewer actions. Results calculated using data reduction may be reevaluated by editing data reduction parameters or selecting a different method.

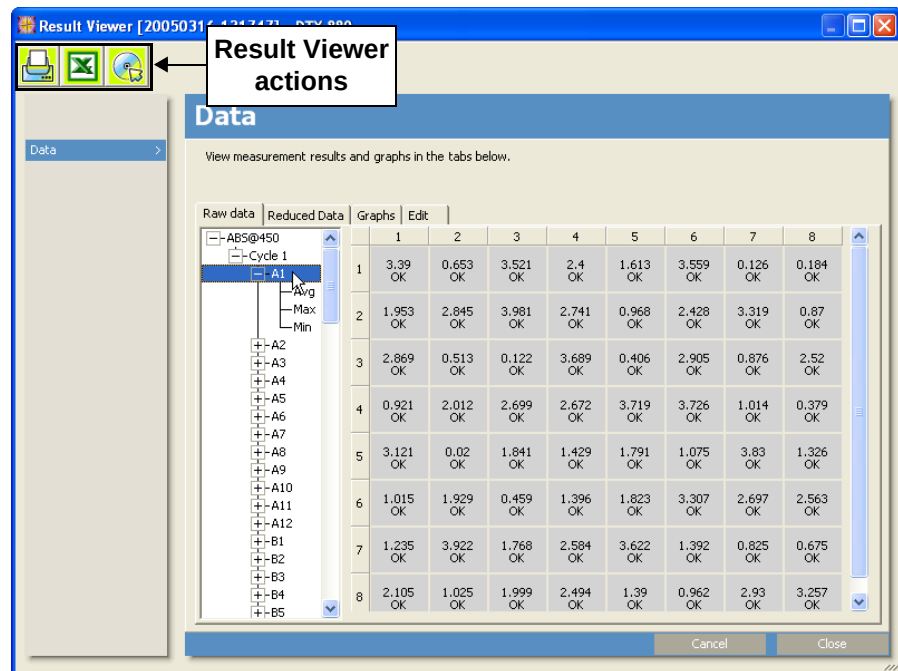


Figure 7-2. Viewing results of an area scan measurement

This section covers Result Viewer functionality provided in the Data screen, which is displayed for basic and analysis applications, including:

- [Viewing Raw Data](#) (Section 7.2.1).
- [Viewing Reduced Data](#) (Section 7.2.2).
- [Viewing Mean Data](#) (Section 7.2.3).
- [Viewing Graphs](#) (Section 7.2.4).
- [Recalculating Data Reduction](#) (Section 7.2.5).
- [Exporting Measurement Results to Microsoft® Excel](#) (Section 7.2.6).
- [Saving Measurement Results](#) (Section 7.2.7).

Note: When the optional Concert - TRIAD Series Analysis Software module is installed, the Result Viewer also displays transformed measurement results for analysis options configured in the protocol (refer to Section 7.3, [Viewing and Reevaluating Results from an Analysis Application](#)).

7.2.1 Viewing Raw Data

The Raw Data tab displays all data measured during the protocol run (Figure 7-3). Depending on the measurement type(s) configured in the protocol, the left pane lists all detection methods, measurement cycles, or wells in a tree view. Selecting a method, cycle, or well displays measured values and status in the right panel. A result may be rejected as an outlier when the value falls outside of the expected result.

Note: Results for single-point measurements are displayed in Raw Data.

To view raw data:

1. Select the **Raw Data** tab, if necessary.

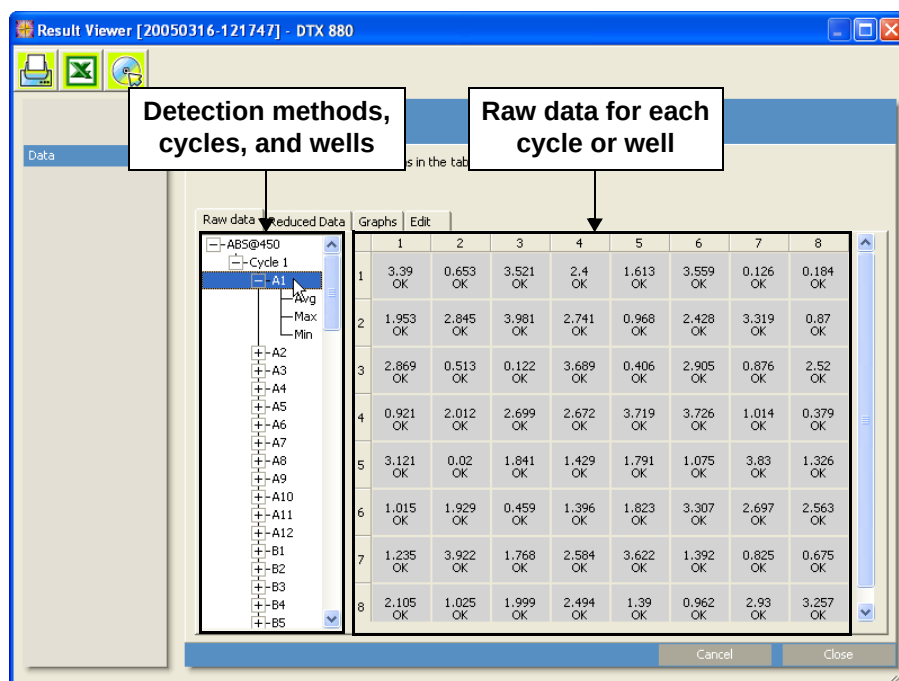


Figure 7-3. Viewing raw data for an area scan measurement

2. From the tree view in the left pane, select the detection method, measurement cycle, or well desired to view. Results and status appear in the right pane. Table 7-2 describes the status indicators that may be displayed.

Table 7-2. Well Status Indicators

Status	Description
OK	The sample was measured successfully.
Error	The sample was not measured because an instrument error occurred.
Overflow	No result is available because the value exceeds the indication limit.
Underflow	No result is available because reduced data could not be calculated.
Extrapolated	The result fell within the extrapolation percentage set for a standard curve.
Not Evaluated	The measurement result was not evaluated.
Rejected	The sample was rejected as an outlier by a user. Samples may be rejected in any tab displaying a matrix view of measurement results.
Unused	The sample was not selected for measurement in the protocol.

7.2.2 Viewing Reduced Data

The Reduced Data tab is displayed when the detection method(s) configured in the protocol use data reduction to calculate a single value from multiple measurement cycles or points (Figure 7-4). Wells may also be rejected as outliers when the calculated value falls outside of the expected result. Reduced data for the plate may be recalculated with outliers removed, if desired.

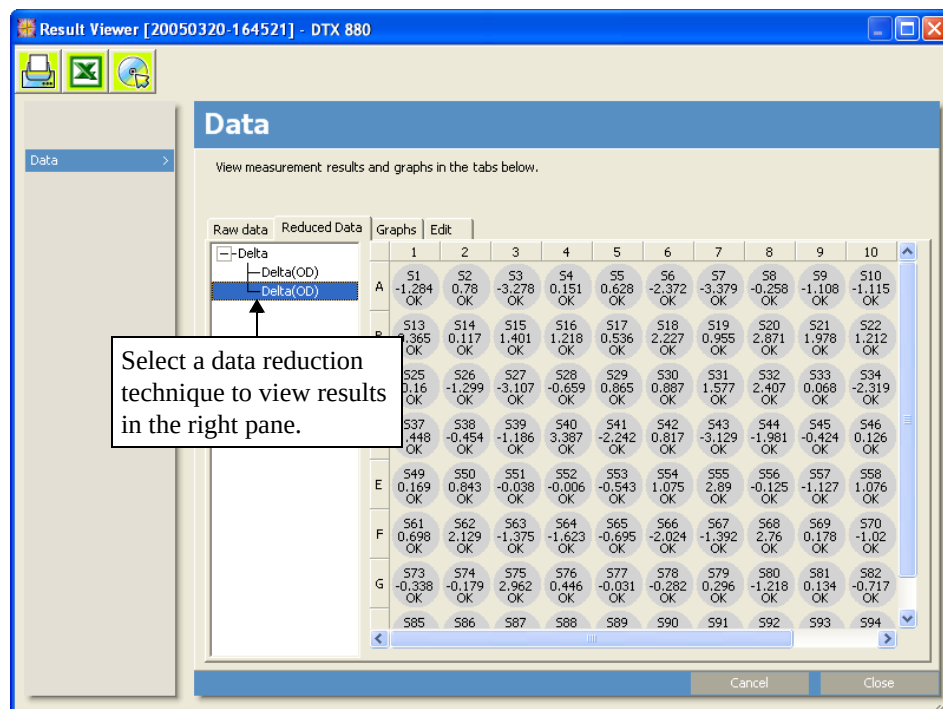


Figure 7-4. Viewing reduced data for a measurement performed in a multiwavelength protocol

To view reduced data, reject outliers, and recalculate reduced data:

1. Select the **Reduced Data** tab, if necessary.
2. If multiple detection methods with data reduction techniques are configured in the protocol, choose the desired data reduction technique from the left pane. Reduced data for selected method appears in the right pane.
3. To reject a well as an outlier, right-click on the desired well and select **Reject Well**. A red X appears over the well and the **Reevaluate current measurement results** button appears on the toolbar.

Note: Multiple wells may be rejected as outliers. Rejected wells may be included in the measurement results again by right-clicking on each well desired and selecting **Accept Well**.



4. From the toolbar, choose **Reevaluate current measurement results** to recalculate the results with outliers removed.

Note: The **Reevaluate** button appears on the toolbar only when a parameter in the results, such as data reduction technique, has been edited.

7.2.4 Viewing Graphs

The Graphs tab displays graphs for all measured wells on a plate (Figure 7-6). The detection method(s) configured in the protocol determine the types of graphs displayed.

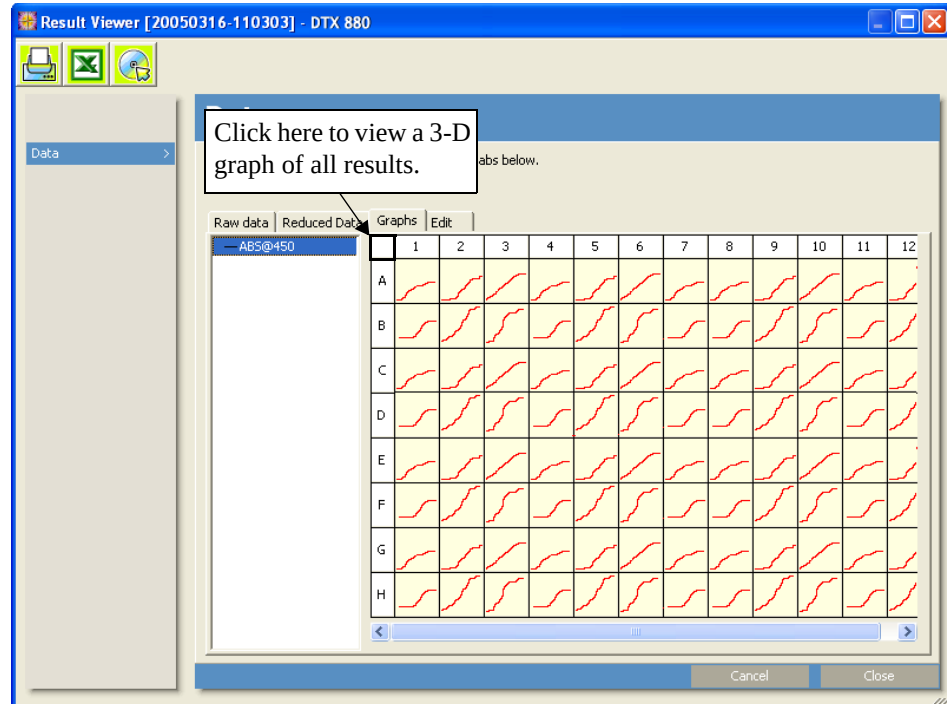


Figure 7-6. Viewing kinetic measurement graphs

Detailed graphs for individual samples, all samples in a column or row, or all samples on the plate may be viewed and printed. To view detailed graphs for:

- an individual sample — click in the desired well. Depending on measurement type, a two- or three-dimensional graph of the selected result appears (refer to Section 7.2.4.1, [Viewing Two-Dimensional Graphs](#) or Section 7.2.4.2, [Viewing Three-Dimensional Graphs](#)).

Note: Detailed graphs for individual samples may be viewed for all measurement types, even when the graphs displayed appear to be empty.

- a row or column — click in the desired row or column header. A three-dimensional graph of results for the row or column appears (refer to Section 7.2.4.2, [Viewing Three-Dimensional Graphs](#)).

Note: Rows and columns may not be selected for multiwavelength and area scan measurement results.

- all samples on the plate — click in the upper left corner of the plate layout (Figure 7-6). A three-dimensional graph of all results on the plate appears (refer to Section 7.2.4.2, [Viewing Three-Dimensional Graphs](#)).

Note: All samples may not be selected for multiwavelength and area scan measurement results.

7.2.4.1 Viewing Two-Dimensional Graphs

Results for individual single-point, kinetic, and linear scan measurements are displayed in two-dimensional graphs (Figure 7-6). Two-dimensional graphs may be printed.

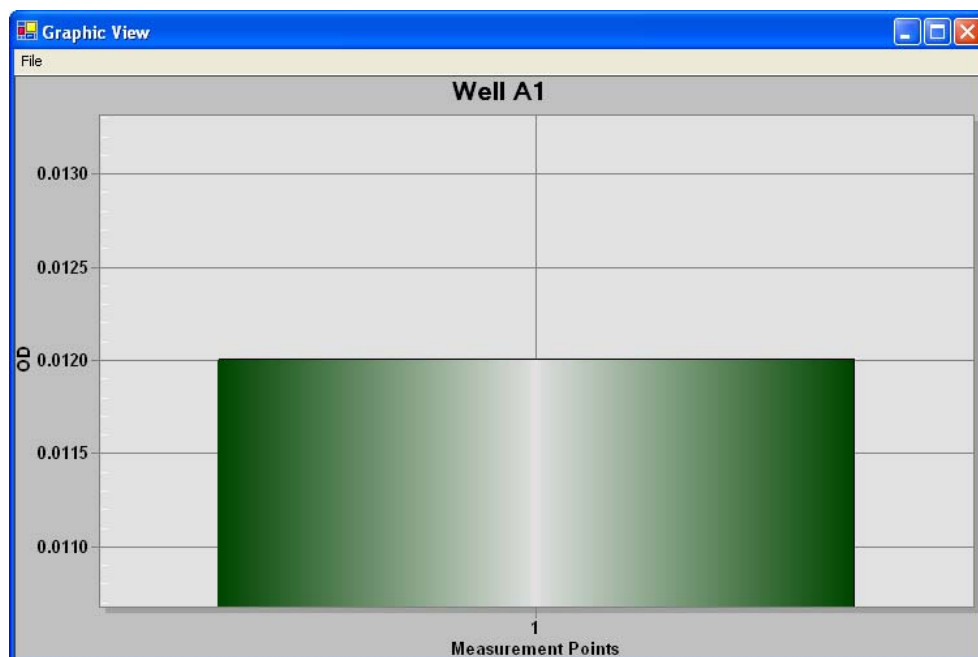


Figure 7-7. Viewing a two-dimensional absorbance graph

To print the graph:

1. From the **File** menu, choose **Print**.

Note: Depending on how Print Settings are configured, Print and/or Print Preview may appear before the protocol configuration prints. Refer to Section 1.4.2.1, [Configuring Print Settings](#), for more information about enabling and disabling Print and Print Preview.

2. If Show Printer Settings and Print Preview are not enabled in Print Settings, the graph prints automatically.

OR

If Print appears, configure printing options as desired and choose **OK**.

Note: Print is the dialog box that appears when Show Printer Settings is selected.

OR

If Print Preview appears, use the toolbar controls to change the magnification, layout view, or page(s) displayed, if desired. Refer to Section 7.7, [Printing Measurement Results](#), for more information about Print Preview.

7.2.4.2 Viewing Three-Dimensional Graphs

Selecting an individual area scan graph, a row, column, or all samples in the Graph tab displays a three-dimensional graph (Figure 7-8). Three-dimensional graphs may be rotated horizontally or vertically and printed.

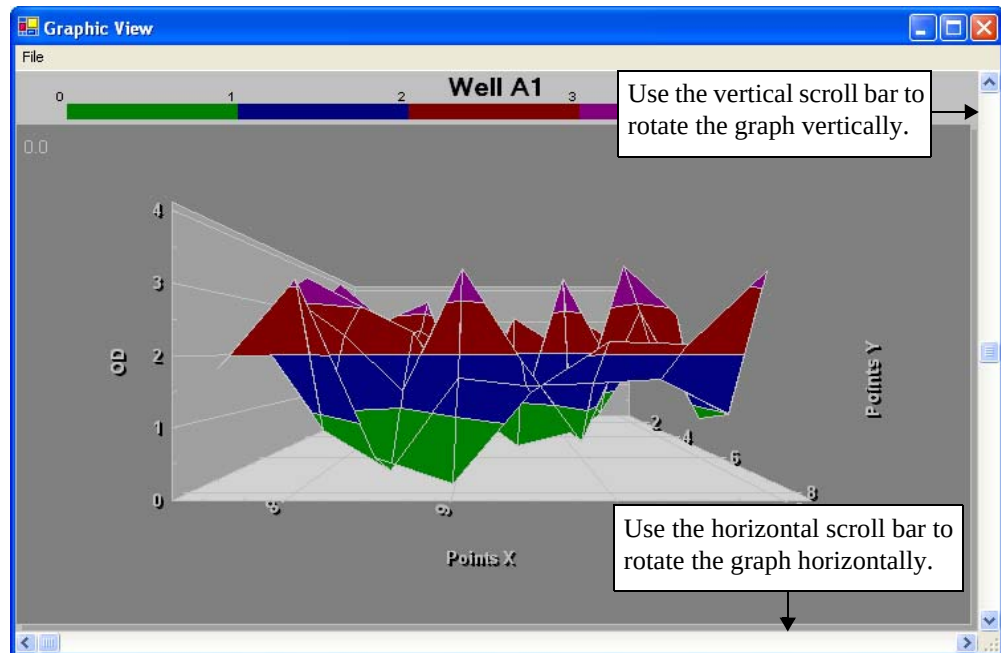


Figure 7-8. Viewing a three-dimensional area scan graph

To rotate the graph:

- Use the vertical scroll bar to rotate the graph vertically.
- Use the horizontal scroll bar to rotate the graph horizontally.
- Double-click on the graph to start and stop a continuous animated horizontal rotation of the graph.

To print the graph:

1. From the **File** menu, choose **Print**.

Note: Depending on how Print Settings are configured, Print and/or Print Preview may appear before the protocol configuration prints. Refer to Section 1.4.2.1, [Configuring Print Settings](#), for more information about enabling and disabling Print and Print Preview.

2. If Show Printer Settings and Print Preview are not enabled in Print Settings, the graph prints automatically.

OR

If Print appears, configure printing options as desired and choose **OK**.

Note: Print is the dialog box that appears when Show Printer Settings is selected.

OR

If Print Preview appears, use the toolbar controls to change the magnification, layout view, or page(s) displayed, if desired. Refer to Section 7.7, [Printing Measurement Results](#), for more information about Print Preview.

7.2.5 Recalculating Data Reduction

The Edit tab allows reduced data to be recalculated by editing the parameters of the current data reduction method or by selecting a different data reduction method (Figure 7-9). Data reduction may be recalculated for any detection method configured with data reduction in the protocol. When multiple detection methods are configured in the protocol, data reduction for the measurement sequence may also be edited.

Note: The Edit tab is available only for measurement results that use data reduction or for results from protocols where a sequence of detection methods is configured.

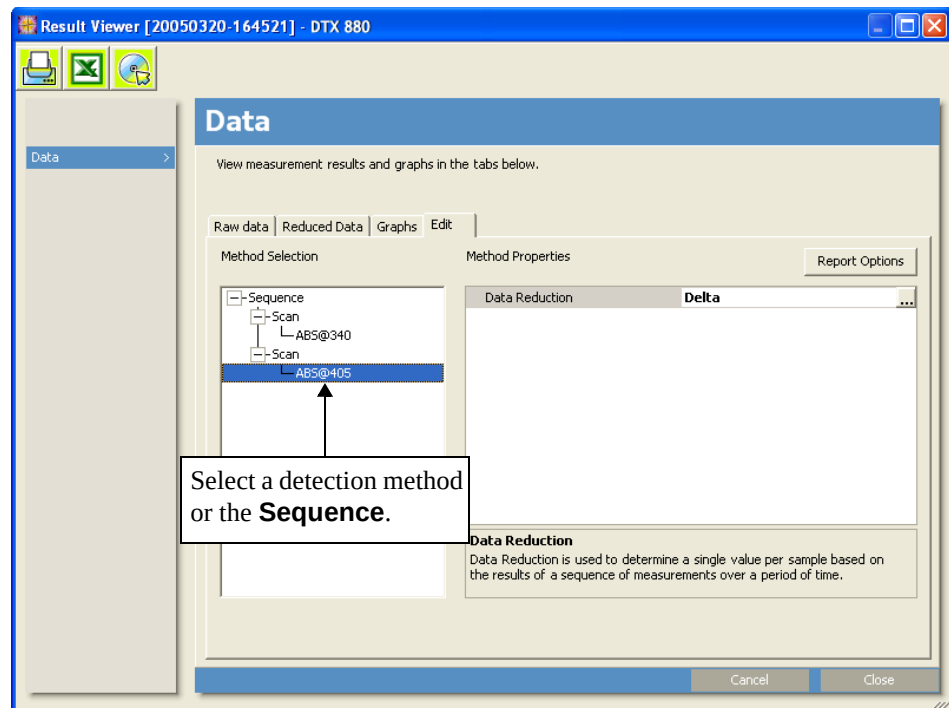


Figure 7-9. Changing data reduction parameters in the Results Viewer

To change parameters:

1. Select the **Edit** tab, if necessary.
2. If multiple detection methods using data reduction appear in Method Selection, choose the desired method or Sequence. The data reduction method currently used appears in Method Properties.



3. In Method Properties, click in **Data Reduction** and choose the configuration button. Data Reduction Method appears (Figure 7-10).

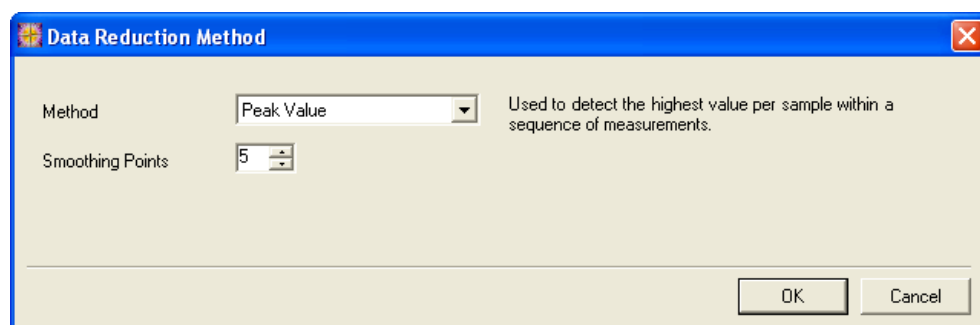


Figure 7-10. Selecting a data reduction method for the sequence

4. In Data Reduction Method, select a different **Method** or edit the method parameters if available.
5. If a different method was selected, configure additional parameters for the selected data reduction method, if required.

Note: Refer to [Appendix A: Data Reduction Techniques](#) for details about the data reduction methods available for different measurement types.

6. Choose **OK** to confirm the selection of the data reduction method.
7. In the Edit tab, choose **Report Options** and select the method information and measurement results data included in printouts:
 - **Method Information** — details about the configured method, including technique type and filter(s) used.
 - **Graph** — graphs of results for all measured samples.
 - **Raw Data** — results from each detection method, kinetic cycle, or well scanned.



8. Choose **Reevaluate current measurement results** to recalculate the results using the new data reduction configuration.

Note: The Reevaluate button appears on the toolbar only when a parameter in the results, such as a data reduction technique, has been edited.

7.2.6 Exporting Measurement Results to Microsoft® Excel

Results displayed in the Result Viewer may be exported to Microsoft® Excel. Exported results are saved in the directory selected in **Directory Settings** (refer to Section 1.4.2.3, [Choosing the Directory Where Exported Measurement Results are Saved](#)).

To export results to Excel:



1. From the toolbar, choose **Export the current measurement results to Excel**. Excel opens automatically.
2. In Excel, note that exported results appear in multiple workbooks. A workbook may contain general information and raw data for a single detection method, or general information and reduced data.

Note: Refer to Section 7.4.1, [Viewing Measurement Results in Microsoft® Excel](#), for information about viewing exported results in Excel.

7.2.7 Saving Measurement Results

The measurement results currently being viewed may be saved to the database from within the Result Viewer, which allows results that have been reevaluated by editing data reduction or analysis parameters to be saved with a different name. Optionally, parameters edited in the Result Viewer may be saved in the original protocol definition.

To save measurement results:



1. From the toolbar, choose **Save the current measurement results to the database**. Question appears, asking if the existing results should be overwritten (Figure 7-11).

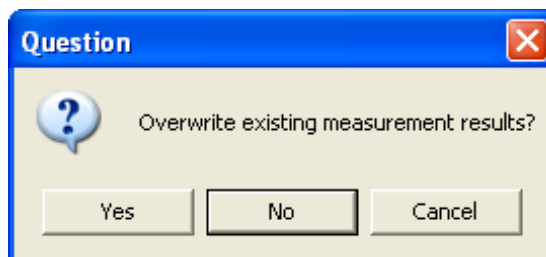


Figure 7-11. Choosing to overwrite existing measurement results

2. Choose **Yes** to overwrite existing results. The results are overwritten and **Message** appears, asking if parameters edited in the **Result Viewer** should also be saved to the protocol definition (Figure 7-13). Proceed to step 4.

Note: When Signet is enabled on the system, measurement results that have been signed may not be overwritten. Refer to Section 7.5, [Signing Measurement Results](#), for more information about signing results.

OR

Choose **No** to save the results with a different name. **Result Name** appears (Figure 7-12).

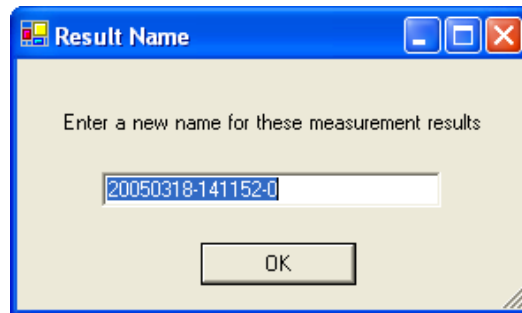


Figure 7-12. Entering a new name for saved results

3. Enter a new name for the results and choose **OK**. The results are saved to the database. **Message** appears, asking if parameters edited in the **Result Viewer** should also be saved to the protocol definition (Figure 7-13).

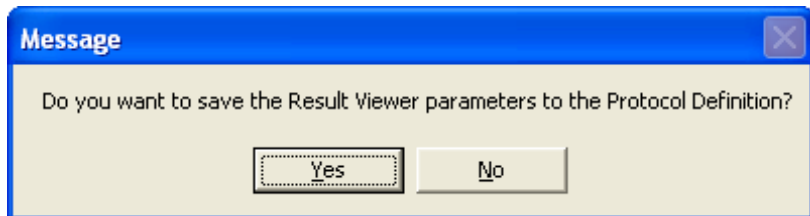


Figure 7-13. Saving parameters edited in the Result Viewer to the protocol

4. Choose **Yes** to save the new parameters to the protocol definition.

Note: When Signet is enabled on the system, parameters changed in the **Result Viewer** may not be saved to protocols that have been signed.

OR

Choose **No** to ignore any changes made and retain the original parameters configured in the protocol.

7.3 Viewing and Reevaluating Results from an Analysis Application

When the optional Concert - TRIAD Series Analysis Software module is installed, the Result Viewer displays measurement results, transformed data from the analysis options configured in the protocol, and the parameters currently configured for each analysis option.

Multiple “what if?” analyses on transformed data may be performed by editing the parameters configured for an analysis option and then reevaluating the data with the new parameters.

This section covers:

- [Viewing Results From an Analysis Protocol](#) (Section 7.3.1).
- [Reevaluating Results from an Analysis Protocol](#) (Section 7.3.2).

Note: Refer to Section 7.2, [Viewing Measurement Results in the Result Viewer](#), for information about viewing results reported in the Data screen, recalculating data reduction, and exporting and saving results.

7.3.1 Viewing Results From an Analysis Protocol

All analysis options configured in the protocol appear in the navigation pane of the Result Viewer (Figure 7-14). Transformed data and parameters for the selected analysis option appear in a series of tabs.

To view analysis results and parameters:

1. In the navigation pane, choose the desired analysis option. Only analysis options configured in the protocol are listed. A series of tabs with results from the selected analysis option appears (Figure 7-14).

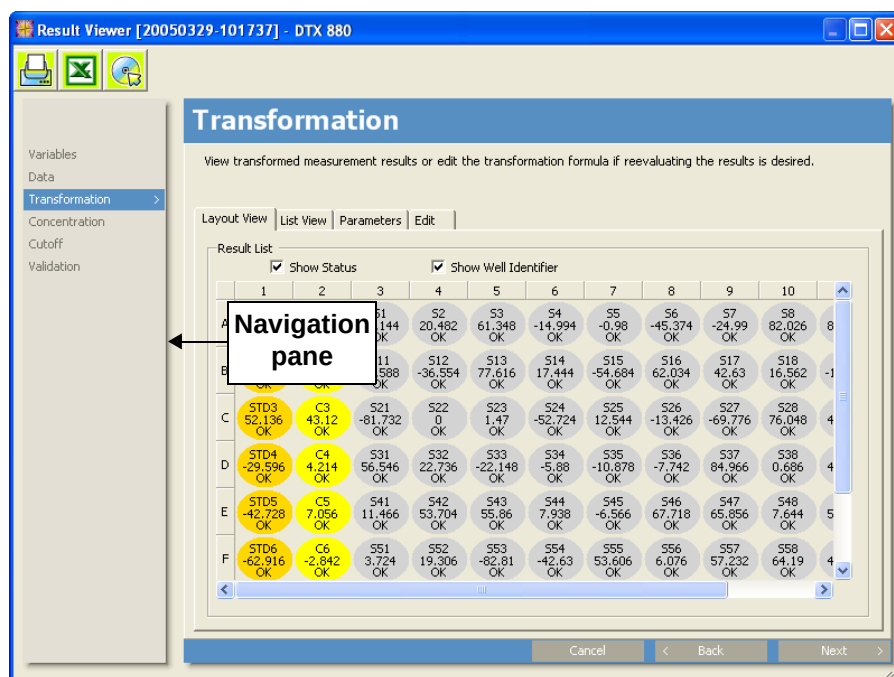


Figure 7-14. Viewing existing transformation parameters in the Results Viewer

2. Choose the tab desired to view. Table 7-3 describes each tab and lists which analysis options display the tab.

Table 7-3. Measurement Results Tabs Displayed for Analysis Options

Tab	Description	Appears In
Layout View	Displays transformed results and measurement status for the selected analysis option in a matrix corresponding to the plate layout. Note: Results may be rejected as outliers in any Layout View tab. To reject a result, right click on the desired sample and choose Reject Well . Results may be reevaluated with outliers removed.	Transformation Concentration Cutoff
List View	Displays transformed results and measurement status for the selected analysis option in a list.	Transformation Concentration Cutoff
Standard Curve	Displays a graph of the standard curve. Refer to Section 7.3.1.1, Changing the Standard Curve Graph View , for information about customizing the graph display.	Concentration
Parameters	Displays the parameters used to calculate the transformed data currently displayed in the Layout View and List View tabs.	Variables Transformation Concentration Cutoff Validation
Edit	Edit the parameters configured for the analysis option using the same configuration screen that appears in the Create Protocol wizard (refer to Section 7.3.2, Reevaluating Results from an Analysis Protocol).	Variables Transformation Concentration Cutoff Validation

7.3.1.1 Changing the Standard Curve Graph View

The standard curve graph view may be changed by zooming in on a selected region or changing view options.

To zoom in on a region of the graph:

1. Position the cursor at the desired starting point for the region, then click and hold the mouse button down. The cursor icon changes to a magnifying glass.
2. Drag the mouse until the desired region is selected. The selected region is highlighted in black.
3. Release the mouse button. The selected region is displayed.

To zoom out and view the graph at the original size:

Right-click on the graph and choose **Undo Zoom** from the menu that appears.

To change view options:

Right-click on the graph and choose a view option from the menu that appears. Table 7-4 describes the view options available.

Table 7-4. Standard Curve Graph View Options

View Option	Description
Viewing Style	Select how the graph is displayed: in Color, Monochrome, or Monochrome with symbols.
Numeric Precision	Select the numeric precision of graph data displayed onscreen or exported to text files. Precision up to three decimal positions may be specified.
Plotting Method	Select how the graph is plotted. Line is the default method.
Data Shadows	Enable shadows that give the graph a 3-D appearance.
Grid Options	Customize the grid display. Grid lines may be displayed, hidden, or changed to a different style, such as thick, thin, or dashed.
Include Data Labels	Select to display labels for data points on the curve.
Mark Data Points	Select to mark each data point with a small circular symbol.
Undo Zoom	Select to display a zoomed graph at the original size. Available only when the graph is zoomed.
Maximize	Select to display a full-screen version of the graph. Close the maximized view by pressing the ESC key or clicking on the title bar of the maximized window.
Customization Dialog	Open the Customization dialog box. Customization options are grouped in a series of tabs: • General — Enter a title for the graph, change the viewing style (color or monochrome), set the numeric precision up to 3 decimal positions, and change the grid appearance. • Plot — Change the plotting method, and enable or disable 3-D shadows and data point markers. • Subsets — This tab contains no configurable options. • Axis — Change the properties of the X- and Y-axes. • Font — Change the font used for titles and labels. • Color — Change the color of any graph attribute except data points and lines. • Style — Change the colors and styles of data points and lines displayed in the graph. Note: Many of the options available in Customization are the same as those in the menu that appears when right-clicking on the graph.
Export Dialog	Open the Export dialog box.

7.3.2 Reevaluating Results from an Analysis Protocol

Multiple “what if?” analyses on transformed data may be performed by editing the parameters configured for an analysis option and then reevaluating the data with the new parameters. The parameters used to calculate the transformed data currently displayed in the Result Viewer are viewed in the Parameters tab. Parameters are edited in the Edit tab.

To reevaluate measurement results:

1. In the left pane, choose an analysis option to edit. Only analysis options configured in the protocol are listed. The selected analysis option appears (Figure 7-15).

Note: Select **Data** to view measurement results and edit data reduction parameters configured in the protocol. Refer to Section 7.2, [Viewing Measurement Results in the Result Viewer](#), for more information.

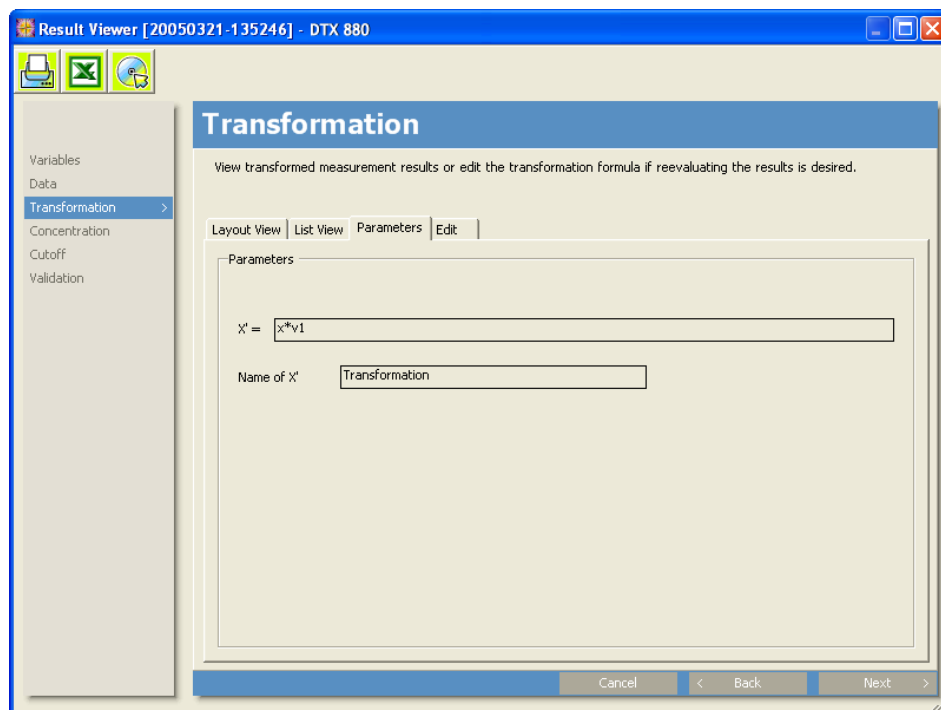


Figure 7-15. Viewing existing transformation parameters in the Results Viewer

2. Select the **Layout View** or **List View** tab to view the current transformed data. Layout View displays data in a matrix corresponding to the plate layout; List View displays the same data in a list.
3. Select the **Parameters** tab to view the parameters used to calculate the transformed data currently displayed; for example, Figure 7-15 shows transformation parameters.

4. Select the **Edit** tab to edit parameters as desired (Figure 7-16). Parameters in the Edit tab are identical to those in the corresponding screen in the protocol configuration. Refer to the appropriate section in Chapter 6 for more information:
 - Section 6.2.6, [Configuring Variables \(Concert - TRIAD Series Analysis Software only\)](#).
 - Section 6.2.7, [Configuring a Transformation Formula \(Concert - TRIAD Series Analysis Software only\)](#).
 - Section 6.2.8, [Configuring Concentration \(Concert - TRIAD Series Analysis Software only\)](#).
 - Section 6.2.9, [Configuring Cutoff Values \(Concert - TRIAD Series Analysis Software only\)](#).
 - Section 6.2.10, [Configuring Validation Rules \(Concert - TRIAD Series Analysis Software only\)](#).

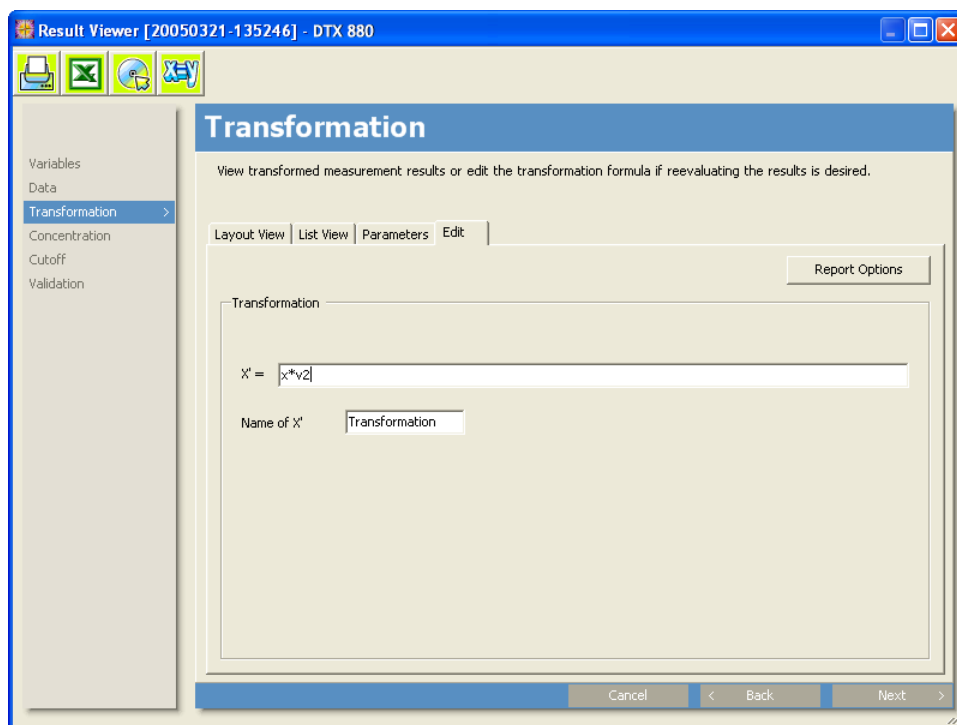


Figure 7-16. Editing transformation parameters in the Results Viewer

5. Edit additional analysis options, if desired.
6. From the toolbar, choose **Reevaluate current measurement results** to recalculate the results using the edited parameters.



Note: The Reevaluate button appears on the toolbar only when a parameter in the results, such as the transformation formula, has been changed.

7. Optionally, save the reevaluated results with a different name to preserve a record of changes made to the parameters (refer to Section 7.2.7, [Saving Measurement Results](#)).

7.4 Viewing Exported Measurement Results

Measurement results may be exported manually from the Results Viewer or automatically at the end of a protocol run when export options are configured in Output Settings.

Two file export and save options are available:

- **Export to Microsoft Excel** — saves results in a format compatible with Microsoft Excel, and automatically opens Excel. Refer to Section 7.4.1, [Viewing Measurement Results in Microsoft® Excel](#), for more information about viewing exported results in Excel.

Note: Concert - TRIAD Series Software automatically determines the appropriate export method based on the version of Microsoft Office installed on the host computer. XML (.xml) files are exported when Office XP is installed. When Office 2000 installed, the measurement results are copied into a new spreadsheet which must be saved in Excel. Versions of Excel prior to Office 2000 are not supported by the Export to Microsoft Excel function, but can open measurement results stored in tab-delimited data (.dat) files.

- **Create .XML and .dat data files** — saves results in .xml and tab-delimited data (.dat) files, which may be opened by compatible software applications.

Note: Refer to Section 6.2.11, [Configuring Output Settings](#), for more information about configuring export and file options.

To view saved measurement results:

1. Open the desired software application.
2. Browse to the directory where exported measurement results are stored, and open the desired file. Exported measurement results are stored in the data directory selected in Software Settings (refer to Section 1.4.2.3, [Choosing the Directory Where Exported Measurement Results are Saved](#)).

7.4.1 Viewing Measurement Results in Microsoft® Excel

When measurement results for a protocol run are exported to Excel, multiple workbooks (spreadsheets) are created. A workbook is created for the raw data read for each detection method configured in the protocol. Reduced and transformed data are included in a separate workbook.

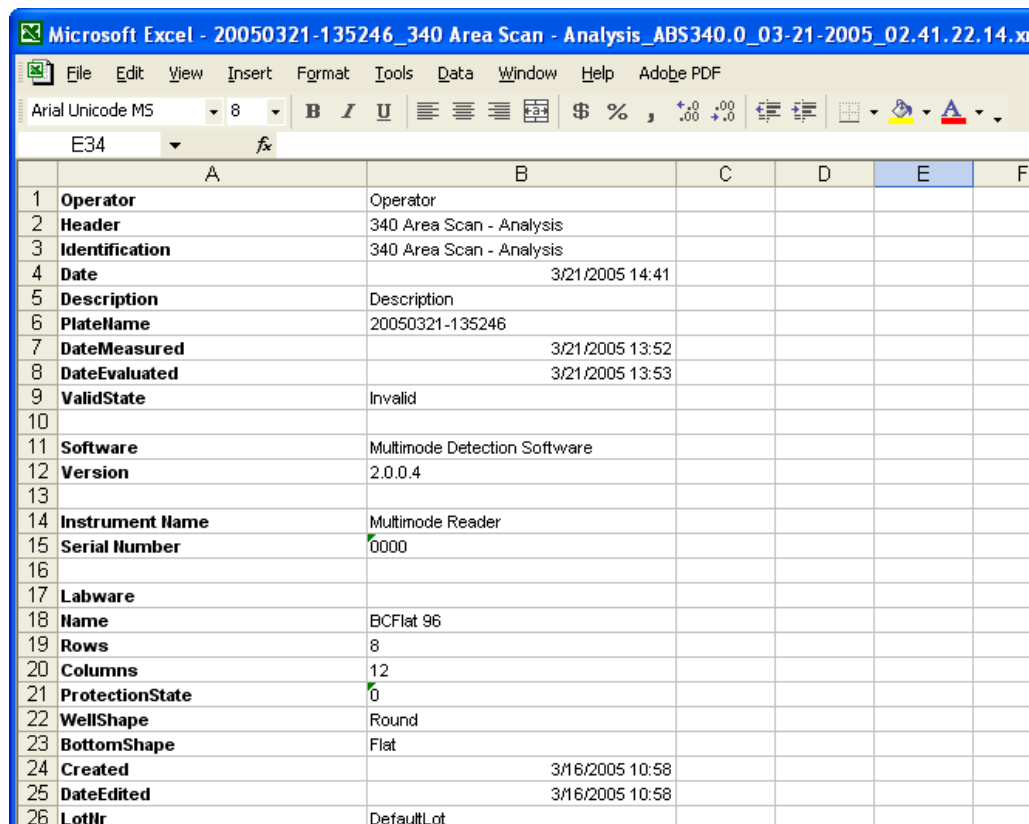
Note: Transformed data is available only when the optional Concert - TRIAD Series Analysis Software module is installed on the system.

This section covers:

- [Viewing Protocol and Measurement Information](#) (Section 7.4.1.1).
- [Viewing Raw Data](#) (Section 7.4.1.2).
- [Viewing Reduced and Transformed Data](#) (Section 7.4.1.3).

7.4.1.1 Viewing Protocol and Measurement Information

Information about the system and parameters configured in the protocol is saved in the General worksheet. General is included in all worksheets exported from a set of measurement results (Figure 7-17).



Microsoft Excel - 20050321-135246_340 Area Scan - Analysis_ABS340.0_03-21-2005_02.41.22.14.xls

File Edit View Insert Format Tools Data Window Help Adobe PDF

Arial Unicode MS 8 B I U \$ % , +.0 -.00

E34 fx

	A	B	C	D	E	F
1	Operator	Operator				
2	Header	340 Area Scan - Analysis				
3	Identification	340 Area Scan - Analysis				
4	Date	3/21/2005 14:41				
5	Description	Description				
6	PlateName	20050321-135246				
7	DateMeasured	3/21/2005 13:52				
8	DateEvaluated	3/21/2005 13:53				
9	ValidState	Invalid				
10						
11	Software	Multimode Detection Software				
12	Version	2.0.0.4				
13						
14	Instrument Name	Multimode Reader				
15	Serial Number	0000				
16						
17	Labware					
18	Name	BCFlat 96				
19	Rows	8				
20	Columns	12				
21	ProtectionState	0				
22	WellShape	Round				
23	BottomShape	Flat				
24	Created	3/16/2005 10:58				
25	DateEdited	3/16/2005 10:58				
26	LotNr	DefaultLot				

Figure 7-17. Viewing protocol information in the General worksheet (excerpt)

To view the General worksheet:

1. In Excel, access either workbook containing the desired results.
2. Choose the **General** tab in the lower left corner of the window.

7.4.1.2 Viewing Raw Data

Measurement results exported to Excel display raw data in matrices corresponding to the plate layout (Figure 7-18). Data from each measurement cycle or point is presented in a separate sheet within the workbook.

Note: Results from protocols containing multiple detection methods export raw data from each detection method to a separate workbook. The title of workbooks containing raw data always includes the name of the detection method.

	A	B	C	D	E	F	G
31	7	2.576				3.274	0
32	8	0.1				3.923	3
33	9	3.006				3.796	3
34	10	1.213	0.122	0.704	1.637	3.217	0
35	11	1.438	0.033	2.102	0.367	3.066	3
36	12	0.744	2.629	3.137	3.919	1.399	3
37	13	2.465	0.345	1.959	3.98	2.014	
38	14	3.71	3.638	1.714	2.176	2.722	3
40	Well 1.3	1	2	3	4	5	6
41	1	1.016	2.693	3.545	0.306	1.864	3
42	2	0.218	1.727	0.102	3.621	1.423	2
43	3	1.712	3.702	3.671	0.259	3.217	2
44	4	3.718	3.743	1.113	0.484	3.007	1
45	5	2.532	0.651	2.874	3.266	3.84	1
46	6	1.219	3.194	0.819	3.037	1.251	1

Figure 7-18. Viewing raw data (excerpt)

To view raw data:

1. In Excel, access the workbook containing raw data for the desired measurement results. Titles of workbooks containing raw data always contain the name of a specific detection method configured in the protocol; for example, ABS340 (Figure 7-18).
2. In the worksheet, choose the **Cycle** tab for the desired measurement cycle.

7.4.1.3 Viewing Reduced and Transformed Data

Reduced and transformed data are exported to a different Excel workbook than raw data. Reduced data generally appears in a sheet named **Measurement**; transformed data appears in sheets with names corresponding to the analysis options configured in the protocol.

Note: Transformed data appears in results for protocols with analysis options configured. The optional Concert - TRIAD Series Analysis Software module must be installed to configure analysis options in protocols.

ResultData always appears in the title of a workbook containing reduced or transformed data.

	A	B	C	D	E	F	G
1							
2		1					
3	1		-1.633	-0.411	2.491		-0.299
4	2		-2.431	0.098	1.678		0.278
5	3		1.091	-0.635	-2.626		0.927
6	4		-0.536	-3.413	0.618		2.873
7	5		-0.844	3.025	-3.699		0.55
8	6		-4.663	-1.5	-0.875		2.326
9	7		3.447	4.632	-2.909		-0.339
10	8		-2.664	0.209	-1.651		-3.374
11							
12	ColorCode	AnalysisStatus					
13		OK					
14		Overflow					
15		Error					
16		Underflow					

Figure 7-19. Viewing reduced data (excerpt)

To view reduced or transformed data:

1. In Excel, access the workbook containing reduced or transformed data for the desired measurement results. Workbooks containing reduced or transformed data always contain **ResultData** in the title.
2. In the worksheet, choose the desired tab to view.

7.5 Signing Measurement Results

On systems with the optional Signet module installed and enabled, measurement results may be signed to prevent them from being deleted or overwritten. Signed results from protocols configured with data reduction and/or analysis options may be reevaluated; however, reevaluated results must be saved using a different name. Reevaluated results are not signed by default.

Results may be signed at any time by users who are assigned a role containing the Sign permission. Refer to Section 3.3.1.1, [Configuring Roles for Concert - TRIAD Series Software User Accounts](#), for more information about roles and permissions.

To sign measurement results:

1. In the Results Selection List, select the measurement results to sign.
2. From the toolbar, choose **Sign the selected result**. Sign the Selected Item appears.



OR

From the Actions menu, choose **Sign the selected result**.

OR

Right click on the desired results and choose **Sign the selected result**.

3. In Sign the Selected Item, add an electronic signature by following the instructions in Section 3.4.5, [Adding Electronic Signatures and Comments to Items](#).

7.6 Deleting Measurement Results

Measurement results may be deleted from the Results Selection List. When the optional Signet module is installed and enabled on the system, results that have been signed may not be deleted (refer to Section 7.5, [Signing Measurement Results](#)).

Note: When Signet is enabled, only users assigned a role containing the Delete permission may delete measurement results (refer to Section 3.3.1.1, [Configuring Roles for Concert - TRIAD Series Software User Accounts](#)).

To delete measurement results:

1. In the Results Selection List, select the results to delete.
2. From the toolbar, choose **Delete the selected result**. Message appears (Figure 7-20).



OR

From the Actions menu, choose **Delete the selected result**.

OR

Right-click on the desired results and choose **Delete the selected result** from the menu that appears.

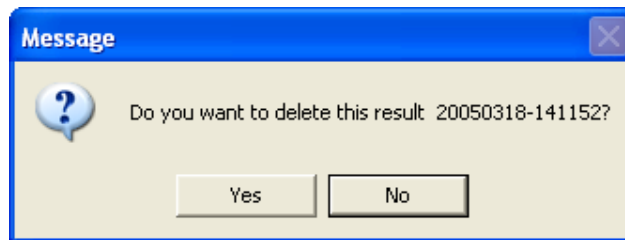


Figure 7-20. Confirming the deletion of measurement results

3. Choose **Yes** to delete the selected results.
- OR
- Choose **No** to cancel the deletion.

7.7 Printing Measurement Results

Measurement results may be printed from the Results Selection List or the Result Viewer. Printed reports include information about the protocol and all Report Options configured in the protocol.

Depending on how Print Settings are configured, Print and/or Print Preview may appear before the measurement results print. Refer to Section 1.4.2.1, [Configuring Print Settings](#) for information about enabling and disabling Print and Print Preview.

To print measurement results:



1. To print from the Results Selection List, select the results to print and choose the print button on the toolbar.

OR

To print from the Result Viewer, choose the print button on the toolbar.

2. If Print appears, configure printing options as desired and choose **OK**.

OR

If Print Preview appears, use the toolbar controls to change the magnification, layout view, or page(s) displayed, if desired (Figure 7-21)

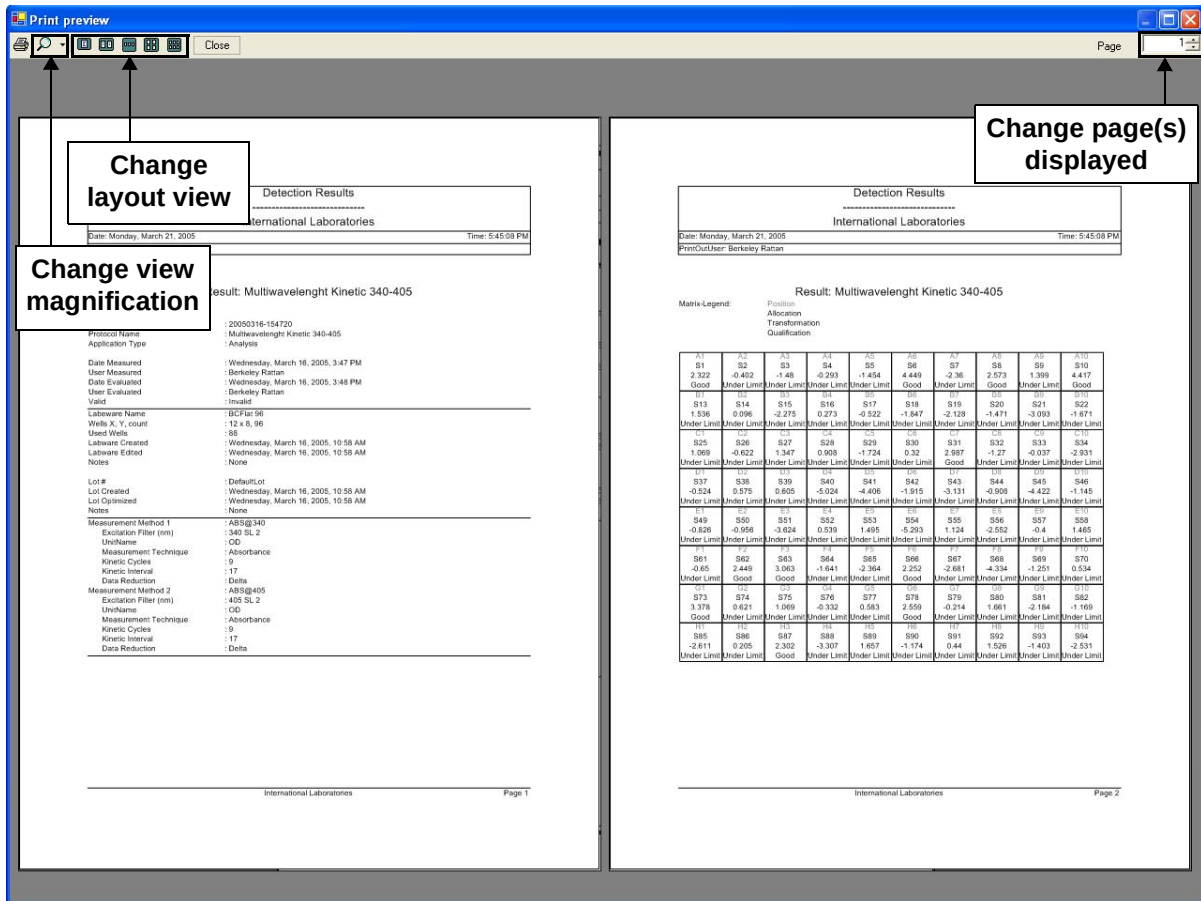


Figure 7-21. Previewing a measurement results printout

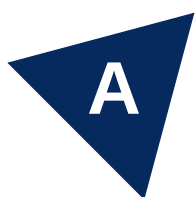


3. In Print Preview, choose **Print** to print out the measurement results.



4. In Print Preview, choose **Close** to close the window.

Note: Choosing Close without first choosing Print cancels the printout.



Appendix A: Data Reduction Techniques

A.1 Supported Data Reduction Techniques

The tables in this appendix describe the data reduction techniques supported by the software:

- Table A-1 describes the techniques available for scan measurements and measurement sequences configured in protocols.
- Table A-2 describes the techniques available for kinetic measurements.
- Table A-3 describes techniques available for fluorescence polarization measurements performed on a TRIAD.

Table A-1. Scan Measurement and Sequence Data Reduction Techniques

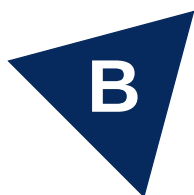
Data Reduction Technique	Description	Parameters
Delta	Difference between the first and last points measured in a well.	N/A
Mean	Determines the mean value per sample from the points measured.	N/A
Peak Value	Used to detect the highest measured value per sample.	Smoothing Points

Table A-2. Kinetic Data Reduction Techniques

Data Reduction Technique	Description	Parameters
Average Slope	Determines the average slope of the reaction curve by calculating the average of all linear regressions calculated over each group of Smoothing Points in the kinetic reading sequence. A decreasing slope shows a decline.	Smoothing Points
Delta	Difference between the first and last kinetic measurements in a protocol run.	N/A
Delta Max Slope	Difference between the first measurement and the center point of the maximum slope. Note: The center point of the maximum slope is calculated by determining the center point between the smoothing points of the regression line with the maximum slope.	Smoothing Points
Delta Time Absolute	Time elapsed from one preselected measurement value to another.	Lower Limit Upper Limit
Delta Time Max Slope	Time difference in seconds between the first measurement and the occurrence of the center point of the maximum slope. Note: The center point of the maximum slope is calculated by determining the center point between the smoothing points of the regression line with the maximum slope.	Smoothing Points
Delta Time Relative	Time elapsed in seconds from the first measurement to reaching a set increase/decrease amount from the first measurement value.	In-/Decrease
Max Declining Slope	Determines the maximum declining rate of the reaction curve by calculating a linear regression over each group of Smoothing Points in the kinetic reading sequence.	Smoothing Points
Max Inclining Slope	Determines the maximum inclining rate of the reaction curve by calculating a linear regression over each group of Smoothing Points in the kinetic reading sequence.	Smoothing Points
Max Slope	Maximum slope of the curve in measurement value/min. The line with the highest slope is calculated, along with maximum reaction speed. Note: The accuracy of this calculation depends on the number of measurement cycles selected.	Smoothing Points
Mean	Determines the mean value per sample within a sequence of measurements.	N/A
Time Peak	Used to detect the time elapsed until the peak value is reached.	Smoothing Points
Peak Value	Used to detect the highest value per sample within a sequence of measurements.	Smoothing Points

Table A-3. Fluorescence Polarization Data Reduction Techniques (TRIAD only)

Data Reduction Technique	Description	Parameters
Polarization	Ratio of the difference between the parallel and the perpendicular polarization intensity [†] components divided by the sum of the two orthogonal fluorescence intensity components. Polarization is calculated according to the formula: $P(mP) = \frac{I(\text{parallel}) - (G\text{-factor}) \times I(\text{perpendicular})}{I(\text{parallel}) + (G\text{-factor}) \times I(\text{perpendicular})} \times 1000$	G-Factor [‡] Threshold ^{‡‡}
Total Intensity	Provides raw fluorescence intensity [†] measurements in the parallel and the perpendicular polarization planes with respect to the plane of linearly polarized excitation light. Total intensity is calculated according to the formula: $\text{Total Intensity} = I(\text{parallel}) + (G\text{-factor}) \times 2 \times I(\text{perpendicular})$	G-Factor [‡]
Anisotropy	The ratio of the difference between the parallel and perpendicular polarization intensity [†] components divided by the sum of the fluorescence intensity parallel to the excitation plane plus the fluorescence intensity perpendicular to the excitation plane multiplied by two. Anisotropy is calculated according to the formula: $A = \frac{I(\text{parallel}) - (G\text{-factor}) \times I(\text{perpendicular})}{I(\text{parallel}) + (G\text{-factor}) \times 2 \times I(\text{perpendicular})}$	G-Factor [‡] Threshold ^{‡‡}
[†] In polarization data reduction techniques, intensity defines sample raw data minus the average of blank replicate raw data. [‡] The G-factor factors out differences in detection efficiency between the polarization planes. The default G-factor is derived from fluorescein measurements performed on several instruments. If a more accurate G-factor has been determined for the connected instrument, it may be entered in the data reduction method configuration. ^{‡‡} Threshold defines the minimum number of counts; values measured below the threshold are noise.		



Appendix B: Mathematical Operators and Functions

B.1 Supported Mathematical Operators and Functions

The tables in this appendix describe the mathematical operators and functions that may be used in formulas:

- Table B-1 describes the mathematical and logical operators supported.
- Table B-2 describes the mathematical functions supported.

Note: In formulas where multiple parameters are configured, separate parameters with a semicolon; for example, `max(S3;S5)`.

Table B-1. Mathematical and Logical Operators

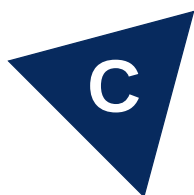
Operator	Description
+	Sums two numbers.
=	Compares two expressions to determine if they are equal.
/	Divides two numbers and returns a numeric result.
<>	Compares two expressions to determine if they are not equal.
>	Compares two expressions to determine if one is greater than the other.
>=	Compares two expressions to determine if one is greater than or equal to the other.
<	Compares two expressions to determine if one is less than another.
<=	Compares two expressions to determine if one is less than or equal to another.
*	Multiplies two numbers.
-	Performs subtraction of two expressions.
-	Unary negation operator indicating the negative value of a numeric expression.

Table B-1. Mathematical and Logical Operators

Operator	Description
AND	Logical AND operator. Performs a logical conjunction on two expressions.
NOT	Logical NOT operator. Performs logical negation on an expression.
OR	Logical OR operator. Performs logical disjunction on two expressions.

Table B-2. Mathematical Functions

Function	Description
abs(number)	Returns the absolute value of a number.
acos(number)	Returns the arccosine of a number.
asin(number)	Returns the arcsine of a number
atan(number)	Returns the arctangent of a number.
cos(number)	Returns the cosine of a number.
exp(number)	Returns e (the base of natural logarithms) raised to a power.
log(number)	Returns the natural logarithm of a number.
max(num1;num2)	Returns the greater of two supplied numeric expressions.
min(num1;num2)	Returns the lesser of two supplied numeric expressions.
pow(base, exponent)	Returns the value of a base expression taken to a specified power.
sin(number)	Returns the sine of a number.
sqrt(number)	Returns the square root of a number.
tan(number)	Returns the tangent of a number.



Appendix C: Software Error Codes

C.1 Troubleshooting Software Error Codes

Table C-1 lists software error codes, error messages, and recommended solutions for resolving errors.

Table C-1. Software Error Codes and Solutions

Error Code	Error Message	Recommended Solution
1	Commanded transport motion exceeds actual physical travel limits.	Check plate parameters configured in Labware Information (refer to Section 5.2.1, Defining Labware Information).
3	Auto calibration ramp parameter exceeds valid range.	Make sure the microplate carrier movement is not obstructed and run the measurement again.
4	Transport is not operational or the transport sensor is defective.	Make sure the transport lock has been removed from the microplate carrier.
5	Transport lost more than 2 full steps.	Make sure the microplate carrier movement is not obstructed.
6	Calibration positioning failed.	N/A
7	Offset calculated in auto calibration is out of expected range. Possible causes: ADC values are too low, lamp is not adjusted, incorrect EEPROM parameters.	Check filter parameters configured in Instrument Settings (refer to Section 2.3.2, Defining and Editing Filter Slides).
8	Filter transport adjustment is out of expected range. Possible causes: insufficient sensor steps, insufficient ramp value, incorrect EEPROM parameters.	Contact a DYNEX Technologies Service Engineer.
9	Z-transport adjust error. Possible causes: wrong well for adjustment, low fluorescein concentration.	In the Read Height Optimization Wizard, confirm that the correct well is selected for the optimization read (refer to Section 6.3.1.1, Optimizing Read Height (TRIAD only)).
10	Measurement attempted with no labware loaded.	Load a plate into the instrument.

Table C-1. Software Error Codes and Solutions

Error Code	Error Message	Recommended Solution
11	The current labware definition is invalid.	Check plate parameters configured in Labware Information (refer to Section 5.2.1, Defining Labware Information).
12	Detection method parameters are invalid.	Check the configuration of detection method parameters.
13	The current labware format is not supported.	Make sure the plate type has been defined (refer to Section 5.2, Creating Labware).
14	Currently loaded labware is not in the correct orientation.	Load the plate into the instrument with the orientation configured in the protocol.
16	Linear scan range exceeds well diameter.	Reduce the number of measurement points in the scan configuration (refer to Section 6.2.5.1, Configuring a Method in Basic Mode).
21	Bright measurement below limit. Check Platedefinition.	Check plate parameters configured in Labware Information (refer to Section 5.2.1, Defining Labware Information).
41	Filter wavelength or filter type in current detection method is not installed.	Check filter parameters configured in Instrument Settings (refer to Section 2.3.2, Defining and Editing Filter Slides).
42	Filter wavelength in command is not defined in any Slide.	Check filter parameters configured in Instrument Settings (refer to Section 2.3.2, Defining and Editing Filter Slides).
44	Currently inserted slide code does not match set slide code. Reinsert slide.	Make sure the correct filter slides are installed in the instrument.
46	No filter slide detected.	Make sure filter slides are installed.
47	Currently inserted filter slide code is invalid.	Make sure the correct filter slides are installed in the instrument.
48	Currently inserted filter slide contains no valid defined filters.	Make sure the correct filter slides are installed in the instrument and check filter parameters configured in Instrument Settings (refer to Section 2.3.2, Defining and Editing Filter Slides).
51	Temperature setpoint exceeds 45°C/113°F.	Check the temperature set in Manual Control and/or the protocol. Set a desired temperature less than 45°C, if necessary (refer to Section 2.3.3.1, Temperature Control (TRIAD only)).
60	Currently inserted LED is not defined.	Contact a DYNEX Technologies Service Engineer.
61	LED causing ADC overflow.	Make sure the correct filter slides are installed in the instrument and check filter parameters configured in Instrument Settings (refer to Section 2.3.2, Defining and Editing Filter Slides).

Table C-1. Software Error Codes and Solutions

Error Code	Error Message	Recommended Solution
62	LED energy too low.	Make sure the correct filter slides are installed in the instrument and check filter parameters configured in Instrument Settings (refer to Section 2.3.2, Defining and Editing Filter Slides).
63	No LED for selected filter installed.	Contact a DYNEX Technologies Service Engineer.
64	ADC gain cannot be maintained.	Contact a DYNEX Technologies Service Engineer.
65	LED gain setting failed.	Contact a DYNEX Technologies Service Engineer.
66	ADC gain fluctuated during measurement, correction of PMT counts is not possible. Try measurement again.	Run the measurement again.
67	Reference ADC too high for valid luminescence measurement.	Make sure the filter compartment and microplate chamber doors are closed.
68	PMT dark counts exceed valid range for measurement. Check threshold or ensure that flaps are closed.	Make sure the filter compartment and microplate chamber doors are closed.
69	Reference ADC LED too low, retry measurement.	Run the measurement again.
140	Command canceled. Aborted by user.	N/A
141	Measurement time exceeds limit for current measurement method.	Use a shorter measurement time in the detection method configuration.
142	Current measurement incomplete, wrong command received.	Check the parameters configured in the protocol.
144	Instrument is busy.	Wait until the amber LED on the instrument is off. If instrument is still busy when the LED is off, turn the instrument off and on.
400	Unknown PIC error.	Contact a DYNEX Technologies Service Engineer.
401	Communication timeout with PIC controller.	Contact a DYNEX Technologies Service Engineer.
403	PIC timeout during a measurement or initialize.	Contact a DYNEX Technologies Service Engineer.
410	Number of steps are zero.	Check the parameters configured in the protocol.
411	LED transport commanded to move to a position less than 0.	Contact a DYNEX Technologies Service Engineer.
412	Shutter transport commanded to move to a position less than 0.	Contact a DYNEX Technologies Service Engineer.
413	Z transport commanded to move to a position less than 0.	Contact a DYNEX Technologies Service Engineer.

Table C-1. Software Error Codes and Solutions

Error Code	Error Message	Recommended Solution
415	LED transport commanded to move to a position greater than maximum travel.	Contact a DYNEX Technologies Service Engineer.
416	Shutter transport commanded to move to a position greater than maximum travel.	Contact a DYNEX Technologies Service Engineer.
417	Z transport commanded to move to a position greater than maximum travel.	Contact a DYNEX Technologies Service Engineer.
419	LED transport initialization failed.	Contact a DYNEX Technologies Service Engineer.
420	Shutter transport initialization failed.	Contact a DYNEX Technologies Service Engineer.
421	Z transport initialization failed.	Contact a DYNEX Technologies Service Engineer.
423	LED transport lost steps.	Contact a DYNEX Technologies Service Engineer.
424	Shutter transport lost steps.	Contact a DYNEX Technologies Service Engineer.
425	Z transport lost steps.	Contact a DYNEX Technologies Service Engineer.
427	LED transport is not energized.	Initialize the instrument (refer to Section 2.2.3, Initializing the Instrument).
428	Shutter transport is not energized.	Initialize the instrument (refer to Section 2.2.3, Initializing the Instrument).
429	Z transport is not energized.	Initialize the instrument (refer to Section 2.2.3, Initializing the Instrument).
431	LED transport error while positioning.	Contact a DYNEX Technologies Service Engineer.
432	Shutter transport error while positioning.	Contact a DYNEX Technologies Service Engineer.
433	Z transport error while positioning.	Contact a DYNEX Technologies Service Engineer.
440	LED number is out of valid range (0-15).	Contact a DYNEX Technologies Service Engineer.
441	LED not initialized.	Contact a DYNEX Technologies Service Engineer.
442	The LED is not powered.	Contact a DYNEX Technologies Service Engineer.
443	The LED has exceeded maximum allowed power consumption.	Contact a DYNEX Technologies Service Engineer.
444	LED power is low.	Contact a DYNEX Technologies Service Engineer.
445	LED power overflow.	Contact a DYNEX Technologies Service Engineer.

Table C-1. Software Error Codes and Solutions

Error Code	Error Message	Recommended Solution
446	No LED installed.	Contact a DYNEX Technologies Service Engineer.
450	No temperature installed.	Check instrument configuration.
451	Temperature setpoint exceeds maximum valid setpoint.	Decrease the temperature setting (refer to Section 2.3.3.1, Temperature Control (TRIAD only)).
452	Temperature sensor is not responding.	Check the current temperature setting (refer to Section 2.3.3.1, Temperature Control (TRIAD only)).
453	Temperature sensor not found.	Decrease the temperature setting (refer to Section 2.3.3.1, Temperature Control (TRIAD only)).

Index

A

- absorbance detection methods
 - configuring 4-6
 - selecting type 4-5
- Accounts & Permissions
 - administering user account 3-5
 - changing administrator password 3-2
 - changing current user's password 3-14
 - configuring roles 3-7
 - default roles 3-8
 - handling disabled user accounts 3-13
 - logging off 3-13
 - logging on 3-12
 - overview 3-1
 - permissions 3-8
 - setting support level 3-3
 - setting up 3-2
 - signing items 3-17
 - system administration
 - restoring the administrator
 - password 3-9
 - unlocking signatures 3-19
 - viewing detection software audit log 3-15
 - viewing signatures 3-19
 - viewing the audit log 3-10
 - viewing unlocked signatures 3-20
- analysis protocols
 - configuring concentration 6-33
 - configuring cutoff values 6-38
 - configuring plate layout 6-11
 - configuring transformation formulas 6-32

- configuring validation rules 6-40
- configuring variables 6-31
- curve fitting methods 6-34
- reevaluating results 7-17

C

- communication settings
 - configuring 1-14
- concentration
 - configuring in analysis protocols 6-33
 - viewing the standard curve graph 7-15
- Concert - TRIAD Series Software
 - accessing online help 1-5
 - configuring communication settings 1-14
 - configuring software settings 1-16
 - error codes C-1
 - installing 1-6
 - launching 1-3
 - overview 1-1
 - setting up 1-12
 - system requirements 1-6
 - using the software interface 1-4
 - viewing audit log 3-15
- copying
 - detection methods 4-16
 - labware 5-12
 - protocols 6-55
- creating
 - detection methods 4-3
 - labware 5-3
 - protocols 6-3

- curve fitting methods 6-34
- cutoff values
 - configuring in analysis protocols 6-38

D

- data reduction
 - recalculating in Result Viewer 7-10
 - techniques for fluorescence polarization measurements A-3
 - techniques for kinetic measurements A-2
 - techniques for measurement sequences A-1
 - techniques for scan measurements A-1
 - viewing reduced data 7-5
 - viewing reduced data in Microsoft Excel 7-22

deleting

- detection methods 4-17
- labware 5-13
- protocols 6-56

detection methods

- configuring absorbance 4-6
- configuring fluorescence intensity
 - bottom 4-9
- configuring fluorescence intensity top 4-8
- configuring fluorescence polarization 4-11
- configuring in protocols 6-15
- configuring luminescence 4-7
- configuring time-resolved fluorescence 4-12
- copying 4-16
- creating 4-3
- deleting 4-17
- editing 4-14
- exporting and importing 4-18
- overview 4-1
- selecting absorbance type 4-5
- selecting for labware optimization 5-15
- selecting technique 4-4
- signing 4-13

E

editing

- detection methods 4-14
- labware 5-9
- labware dimensions 5-10
- labware lots 5-11

- protocols 6-53
- well information 5-10

error codes C-1

- exporting and importing
 - detection methods 4-18
 - labware 5-21

F

filter slides

- adding 2-9
- configuring 2-9
- exporting and importing all configurations 2-11
- exporting and importing individual 2-11
- overview 2-8
- removing 2-10

fluorescence intensity bottom detection methods

- configuring 4-9

fluorescence intensity top detection methods

- configuring 4-8

fluorescence polarization detection methods

- configuring 4-11

- data reduction techniques A-3

G

graphs

- changing the standard curve view 7-15
- viewing for an entire plate 7-7
- viewing three-dimensional 7-9
- viewing two-dimensional 7-8

H

host computer

- removing software from 1-11
- system requirements 1-6

I

installing software

- installing optional modules 1-10
- meeting system requirements 1-6
- on a Windows 2000 or XP system 1-7
- on a Windows NT system 1-9
- overview 1-6
- repairing an installation 1-11

- instrument
 - connecting to 2-4
 - initializing 2-4
- instrument selection list
 - overview 2-1
- instrument settings
 - configuring 2-6
 - filter slides 2-8
 - manual control 2-12
 - emission filter slide control 2-13
 - excitation filter slide control 2-13
 - plate control 2-13
 - temperature control 2-12

K

- kinetic measurements
 - data reduction techniques A-2
- kinetic methods
 - configuring 6-18

L

- labware
 - configuring labware lots 5-7
 - configuring layout settings in a basic protocol 6-9
 - configuring layout settings in a protocol 6-11
 - configuring layout settings in an analysis protocol 6-11
 - copying 5-12
 - creating 5-3
 - defining dimensions 5-3
 - defining well information 5-3
 - deleting 5-13
 - editing dimensions 5-10
 - editing well information 5-10
 - exporting and importing 5-21
 - optimizing
 - manually selecting well centers 5-18
 - overview 5-14
 - performing the optimization 5-17
 - preparing for optimization 5-16
 - selecting detection method 5-15
 - verifying well centers 5-19
 - overview 5-1
 - selecting and editing lots 5-11

- selecting in protocols 6-8
 - selection guidelines 5-6
 - signing 5-8
- logging off 3-13
- logging on 3-12
- logical operators B-1
- luminescence detection methods
 - configuring 4-7

M

- mathematical functions B-2
- mathematical operators B-1
- measurement results
 - choosing storage directory 1-19
 - exporting to Microsoft Excel 7-12
 - from a basic protocol 7-3
 - printing 7-25
 - recalculating reduced data 7-10
 - reevaluating 7-17
 - saving 7-12
 - searching for 7-2
 - signing 7-23
 - viewing exported results 7-19
 - viewing graphs 7-7
 - viewing raw data 7-4
 - viewing reduced data 7-5
 - viewing results in Excel 7-19
 - well status indicators 7-4
- measurement techniques
 - selecting in protocols 6-7
- message boxes
 - reactivating disabled 3-16
- microplate carrier
 - ejecting 2-3
 - loading 2-3

O

- online help
 - accessing 1-5
- optimizing labware 5-14
- optimizing read height 6-48

P

- preparation methods
 - configuring in protocols 6-15
 - configuring shake 6-28

- printing
 - configuring settings 1-17
 - measurement results 7-25
 - protocols 6-57
 - protocols
 - configuring an external program to run 6-44
 - configuring concentration 6-33
 - configuring cutoff values 6-38
 - configuring detection methods 6-15
 - configuring general settings 6-5
 - configuring labware for analysis layouts 6-11
 - configuring labware for basic layouts 6-9
 - configuring labware layout 6-11
 - configuring methods in advanced mode 6-23
 - configuring methods in basic mode 6-16
 - configuring output settings 6-42
 - configuring reading direction 6-14
 - configuring scan measurements 6-20
 - configuring scan methods 6-18
 - configuring transformation formulas 6-32
 - configuring validation rules 6-40
 - configuring variables 6-31
 - copying 6-55
 - creating 6-3
 - deleting 6-56
 - editing 6-53
 - optimizing read height 6-48
 - overview 6-1
 - printing 6-57
 - running
 - in simulation mode 6-51
 - on an instrument 6-46
 - selecting analysis options 6-5
 - selecting labware 6-8
 - selecting methods
 - advanced mode
 - adding set temperature preparation methods 6-29
 - configuring a shake preparation method 6-28
 - configuring set temperature preparation methods 6-29
 - selecting technique type 6-7
 - signing 6-45
- R**
- raw data
 - viewing 7-4
 - viewing in Microsoft Excel 7-21
 - read height
 - optimizing 6-48
 - setting before a protocol run 6-47
 - reduced data
 - viewing 7-5
- S**
- scan measurements
 - configuring 6-20
 - data reduction techniques A-1
 - sequence
 - data reduction techniques A-1
 - shaking
 - configuring a shake preparation method 6-28
 - manual control 2-13
 - signing
 - adding electronic signatures to items 3-17
 - detection methods 4-13
 - labware 5-8
 - measurement results 7-23
 - protocols 6-45
 - unlocking signatures 3-19
 - viewing signatures 3-19
 - viewing unlocked signatures 3-20
 - simulated data files
 - choosing default 1-18
 - selecting before a protocol run 6-51
 - simulation mode
 - choosing default simulated data files 1-18
 - enabling manually 2-5
 - running protocols 6-51
 - software settings
 - choosing data storage directory 1-19
 - choosing default simulated data files 1-18
 - configuring 1-16
 - configuring print settings 1-17

T

temperature control

- configuring a temperature preparation method 6-29

- configuring in Instrument Settings 2-12

time-resolved fluorescence detection methods

- configuring 4-12

transformation formulas

- configuring in analysis protocols 6-32

U

users

- accessing in User Selection List 3-11

- changing password 3-14

- handling disabled accounts 3-13

- logging off 3-13

- logging on 3-12

- reactivating disabled message boxes 3-16

V

validation rules

- configuring in analysis protocols 6-40

variables

- configuring in analysis protocols 6-31

W

well status indicators 7-4

